Midwest Engineer

SERVING THE ENGINEERING PROFESSION

WESTERN SOCIETY OF ENGINEERS FOUNDED 1869

STRUCTURAL ALUMINUM
WSE MEETINGS—PAGE THREE

Vol. 4 SEPTEMBER 1951 No. 1

A GREAT COMMUNITY

MUST HAVE GREAT CULTURAL ASSETS

No community can achieve industrial pre-eminence unless, in addition to its natural advantages, it has the assets that contribute to diversified cultural opportunity. The broad variety of these cultural advantages, developed and enjoyed by the people who live in Chicago and Northern Illinois, have played an important role in making this the great industrial empire of mid-America.

An example is the Chicago Symphony Orchestra. For more than half a century this great organization has spread the enjoyment of music over an ever-widening area. In addition to its enthusiastic following among lovers of the best music, the Chicago Symphony has brought an appreciation of music to generations of youngsters in schools and colleges. It has thus served as an interpreter of the world's music to Chicago area people. But the Symphony is only one of the renowned institutions that bring a full, cultural life to this dynamic community. It takes its place beside the Chicago Art Institute, the Chicago Natural History Museum, the Museum of Science and Industry, the Chicago Public Library, the John Crerar Library, the Newberry Library, the Chicago Historical Society and this area's great universities and medical schools . . . together forming one of the world's greatest centers of learning and the arts.

Indeed, great natural and economic assets are essential to a great community. But opportunities for self-development are equally important. Industrialists, their employees, and their families will find in Chicago and Northern Illinois an abundance of both.

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WESTERN SOCIETY OF ENGINEERS

Serving the Engineering Profession

September, 1951 CONTENTS Vol. 4, No. 1

COVER CREDIT

Northwestern Technological Institute, one of the newer stars in Northwestern University's firmament. 1951 marks the year of the institution's Centennial Celebration. WSE extends congratulations.

Second Young Engineers Forum Scheduled

A second **Forum for Young Engineers** will be held by WSE starting October 23 and running seven consecutive Tuesday evenings except for the Tuesday of Thanksgiving week.

The theme of this Forum will also be "Engineering in Chicago Industry" and the objective will again be that of providing to young engineers an opportunity for expanding their knowledge of engineering in the major lines of business in the community.

The speakers will be leaders in their respective industries. Their talks will be short. Emphasis will be placed on the young engineer meeting and becoming acquainted with the speakers and other leaders in the profession during the social hour in the WSE lounge prior to dinner and in devoting the major part of the meeting itself to the discussion period following the talks.

The initial Forum has gone down in history as one of the outstanding and progressive contributions of WSE to the engineering profession and to industry. So great was its success that many requests for a second Forum were received and as a result the new series of meetings were planned.

The program will include dinner meetings covering the following industries: Utilities, Heavy Manufacturing, Railroads, Oil, Steel, Light Manufacturing, and Small Business, and the Packing Industry.

The registration fee for the Forum series of seven meetings is $25.00 which includes dinner. Reservations will be received by the Secretary's office. Enrollment limited to 100.

H. P. Sedwick elevated to Executive Vice-President P.S. of N.I.

Mr. H. P. Sedwick, Immediate Past President of WSE, was elected to the position of Executive Vice President of Public Service Company of Northern Illinois. He joined the company as an engineer in 1913 and has served as District Superintendent, Assistant to the Vice President in Charge of Operations and as General Manager.

The name Sedwick and Western Society of Engineers are practically synonymous, his dynamic personality is so much a part of the thinking and activities of the Society. An extremely busy man, he has given unselfishly of his time and energies to the welfare of WSE and toward the advancement of the engineering profession. This coupled with his business acumen has singled him out as a man of parts in the community.

In his new position he will handle the operation of a utility company serving 11,000 sq. miles and encompassing 534 communities.

His many friends, business associates and fellow members wish him continuing success.

The Society's organization for the current year has been completed and is functioning. The various sections' Executive Committees have been elected and have named their officers. All committee chairmen have been appointed and have either completed or are in process of naming the personnel of their respective committees. The Program Committee has, in cooperation with the various sections, agreed upon scheduled dates for meetings throughout the fiscal year.

Two items of major importance in our estimated revenues for this year and in which all members are urged to assist, are the securing of new members and of advertising in the Midwest Engineer and in the Year Book which will be issued as part II of the November issue. Each member is urged to cooperate in these two activities and the chairmen of the respective committees will appreciate your help.

The Secretary's office will welcome your requests for any service which the Society may furnish to you.

September 21, Oil Gas Process

SPONSORED BY THE GAS, FUELS AND COMBUSTION SECTION

The use of the oil gas process for peak load and emergency service in a natural gas distribution system will be the subject discussed by **P. L. Born,** Staff Engineer, Public Service Company of Northern Illinois. The speaker will give details of the conversion of fuel oil to a natural gas substituted by means of existing carbureted water gas equipment and the relationship of tar produced to plant control.

October 1, Missouri River Flood Problems

SPONSORED BY THE HYDRAULIC, SANITARY & MUNICIPAL SECTION

WSE members will have an opportunity to hear a first-hand account of the recent Missouri River flood and what is being done to prevent such disasters when Col. **Edward A. Brown, Jr.,** Executive Officer, Missouri River Division, Corps of Engineers, U. S. Army, Omaha, Nebraska, speaks at the October 1 meeting.

Col. Brown is familiar with the many problems confronting U. S. Army Engineers in their attempts to control the raging Missouri. He can speak with authority on Missouri River Flood Control and the work in progress to prevent repetition of the recent floods.

October 3, Junior Division Roundtable

The Junior Division will inaugurate its round-table series of discussions for the year on Wednesday evening, October 3rd. The subject will be Politics. All members are cordially invited to participate.

What's New at WSE . . .

Dining Room under New Management

Opens September 10th

Luncheon 11:30 a.m. to 2 p.m. **Dinner 5:30 p.m. to 8:00 p.m.**

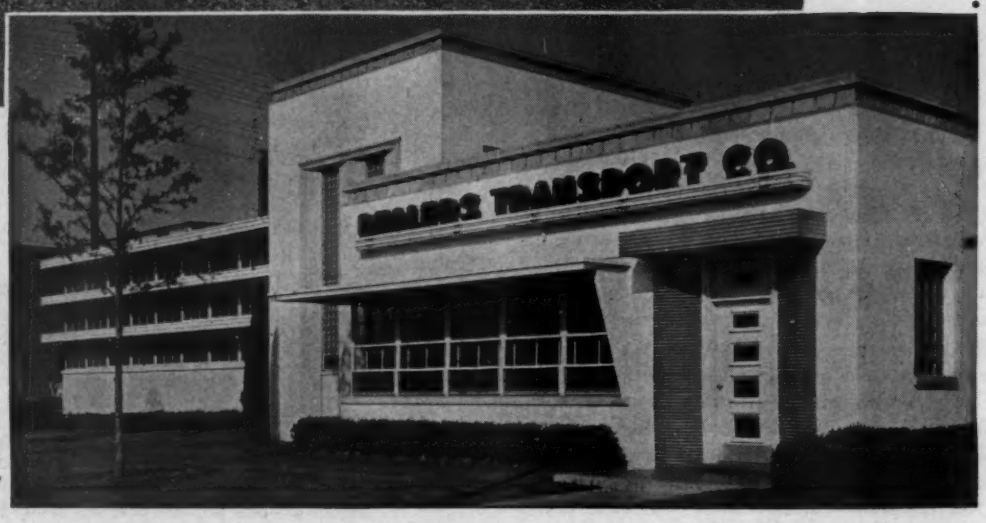
The Board of Direction and the House Committee has taken every means to provide our members with improved dining facilities and menus at reasonable prices.

Two truck terminals in Memphis. Hulsey and Hall, architects; H. B. Hunter, structural engineer.

Upper photo: Office and warehouse, Kimbel Lines; Building Constructors, Inc., contractor.

●

Lower photo: Office and maintenance shops of Dealers Transport Company. B. E. Buffaloe, contractor.



Architectural Concrete

Adds Distinction to Commercial Structures

The two truck terminals illustrated above are excellent examples of the distinction and beauty of modern architectural concrete when used in commercial structures. These buildings demonstrate the individuality and versatility that is possible with architectural concrete.

Architectural concrete is the ideal construction material for buildings of any kind, size or style. Schools, hospitals, apartments, factories or office buildings can be imposing as well as functional when designed in architectural concrete.

Architectural concrete has great strength and durability, yet can be molded economically into delicate ornamentation of any period or design.

Architectural concrete also meets every other essential structural requirement. It's firesafe. Its maintenance cost is low. It has long life. This results in dependable service and ***low annual cost.***

When architects apply the time-tested principles of quality concrete construction, they can design architectural concrete buildings with every assurance of lasting satisfaction to client and designer alike.

Write today for free, illustrated 70-page booklet, "*Design and Control of Concrete Mixtures.*" This manual will be especially helpful in obtaining quality concrete structures. Distribution is made only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION

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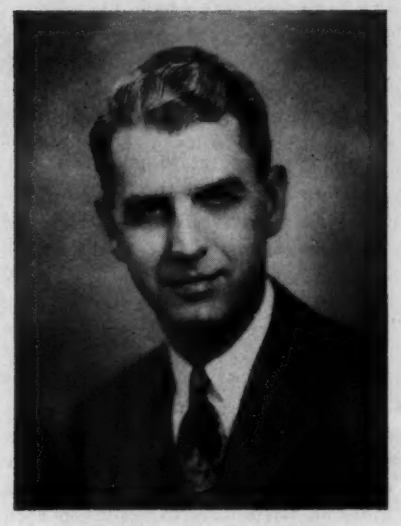
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Memo to Engineers



Addressing the 82nd Annual Meeting of WSE, Mr. Muller, Assistant to the Vice President in Charge of Engineering, Westinghouse Electric Company, points out that engineering as a profession is much more than slide-rules, formulae and blue prints.

by H. N. Muller, Jr.
Assistant to Vice President Westinghouse Electric Corporation

I am not introduced to an audience of this size and calibre without a feeling of deep humility. In the group assembled tonight I see men whose length and breadth of experience far exceeds mine. Indeed, it has been said that the capacity of man's brain is a remarkable thing. It starts working the instant he is born and never stops until he stands up before a group to make a talk. In this Memo to Engineers I will try to focus our thoughts on pertinent facts that frequently miss your everyday critical analysis.

We are going to talk about engineering, but nothing technical in nature will be mentioned. We are going to discuss the broadest concept of engineering, those factors that make the good engineer a truly professional man. According to the Bureau of the Census, there were 475,000 practicing engineers in America in 1950. But I wonder how many of them recognize the several facets of professional life I am going to talk about.

It is a natural tendency of all busy men in today's strained situation, not just of engineers alone, to put one's nose so deeply in the daily task that other functions, vastly important in nature, are virtually forgotten. What I am driving at is not greatly profound, it is just neglected—at least by too many of us. What is the position of engineering in our society; that is, what is its importance relative to other qualified professions? Do we have enough engineers in America and enough neophyte engineers coming along in the colleges? Does the Government and the general public understand what an adequate supply of technical people means to national security? Do successful, experienced engineers realize how far down the road of collectivism our country is, and how much this group of professional people, above all others, could do about it? Do these same eminent engineers recognize, accept, and do something about their responsibility to the new graduate and the young engineer in his employ, to say nothing of their responsibility to the schools themselves? I know that some do, but I also know for sure that many do not! These are the obligations of the engineer that I will point up for your attention, your action, and for a better understanding of the entire engineering profession.

America for the first time in its history is faced with the possibility of war against a foe of vastly superior numbers. Just what does this mean? It's a new concept to Americans. In the past, when faced with a serious international situation, the American people have traditionally adopted an attitude of bravado and egotism. In about so many words they have said, "All right, if they want to get tough, we will roll up our sleeves, go to work, and beat the daylights out of them!" Well, that won't work this time; and the sooner our people realize this fact, the better our chances are going to be. Uncle Sam can no longer afford to play the role of Mr. Big!

Engineering Know-how Key to American Security

What is the answer if total war should come? Can we win it? I think the answer is "Yes", but *only* if we are clearly superior technologically as well as tactically. Technical brainpower, and the products it conceives, is the only way to win against sheer numbers. Some of this brainpower must be in the military, but an even larger share must be in the necessary civilian economy. So, although large segments of our population may not yet realize the facts, the engineers in our productive machine are an elementary necessity for national survival. Certainly you, as members of this profession, as executives, as consultants, and as employed practitioners, are in the strategic position where you can dispel considerable gloom and preach some facts. The very expedient philosophy in a democratic society—that Mrs. Jones' boy and Mrs. Murphy's boy are just alike and must be treated alike—may be a beautiful ideal, but we cannot allow it to be more than an ideal today. If we do, we will be easy prey for the Soviet-Eurasian Giant that would relish such opportunity.

For certain, America has to develop all the technical brains it can single out and train, and you men in industry have to make well-rounded professional men of these people. Also, the military establishment will have to realize that those people capable of creative thinking must be used in capacities commensurate with their training and ability. This is a necessity, whether they can effect the reforms within their own organizations, or whether outside pressure has to do it. In a measure never before appreciated, the know-how of our profession is the key to American security.

WSE To Render Support of Engineering Manpower Commission

I think most of you know that engineers are in short supply in the United States. There are not enough of us to meet the demands of America's productive machine, plus the armed forces. This year there has been what I can aptly term a general scramble for men on the campuses of the engineering schools. A majority of the seniors have job offers that allow a choice of their employer, and I know of one case where an honor student, who was also quite a campus leader, had sixteen offers of employment by the middle of April. Well, over the next several years the picture becomes bleak indeed with decreasing graduations at least through 1954. This important story has been presented to your Society and published in the Midwest Engineer earlier this year. I think you are sufficiently familiar with the critical shortage of new engineering blood coming into our profession. What are you doing about it—as individuals? Anything at all? You can, you know! Most of you still retain some ties with your school. You occupy positions of respect and some prominence in your community. You have a job to do, for experienced engineers can do a lot at the level where the decision to enter an engineering career is first made. You can explain the opportunities of an engineering career to the high school principal, to the counselors, and to parents. You can offer to render expert counseling to high school seniors. You can offer to speak to school and civic groups on the profession of engineering. You can, in short, be a salesman for your profession.

The Engineering Manpower Commission of the Engineers' Joint Council is making a forceful, planned effort to let the general public be really informed concerning the character of the engineering profession and the tremendous opportunities inherent to engineering in our country's future. This group deserves complete support and some of your time and help at the local level. You will hear a great deal more of the Engineering Manpower Commission activities in months to come. Watch for the releases of this group and the notices in the technical journals of the Founder Societies, then render your full support through your Western Society of Engineers, in your community, and in your business.

At the outset I said we were going to talk about the broadest concepts of engineering. This includes some big things, and an understanding of what makes us the best fed, best clothed, best wheeled, and most satisfied people in the world is paramount. While we take this unparalleled standard of living for granted, do most of our people know why we enjoy it, how we achieved it, and how it can possibly be maintained? I don't think they do. In recent years we have fed increasingly on the philosophy that we can get something for nothing, that we can vote anything and everything to ourselves. Our people accept that higher real incomes are a function of the ballot rather than of productive effort. I think it is perfectly clear that everything we have of physical value is the result of natural resources coupled with productive effort, but how can we make this simple, complete truth perfectly clear to our people?

I sometimes think that the fallacious economic beliefs of the American people are about as sound as an economy based on a species of American wild life I have read about in some of our more profound contemporary literature. I forget its classical name, but it is a soft white ham with legs, soulful eyes, and whiskers; it lays wrapped eggs and an endless supply of fresh meat, turnips, suspender buttons, clothes pins, and other necessities of life. It falls over dead if you look at it hungrily. Thanks to its many bounties, everyone in Dogpatch quit working.

Profits in Industry are Desirable, Honorable and Indispensable

The American people have that trait of nature that makes them want more of anything that they think is good enough to be worth wanting at all. Wanting more in itself is good. The ambition to have more of all the good things of life is the very basis for our continuing progress; it is the driving spirit of a good people; it brought our ancestors here; it peopled and civilized this continent. If this driving force ever dies out, we will decline with it.

The disturbing element is not the desire for more, but the lack of realization on the part of the individual that he must produce more in order to have more. This business of wanting more without realizing that we must first produce more is too universal to be blamed on any one group or type of people, and it's a philosophy that is being taught increasingly in high places.

The lesson must be relearned that human wants can only be satisfied by productive effort and that profits in industry are a desirable, honorable, absolutely indispensable part of doing business. But those who would destroy our American system of enterprise, or those who would sacrifice truth for political expediency, have maliciously attacked profits as

(*Continued on Page* 25)

STRUCTURAL ALUMINUM

By Ernest Hartman
Chief Research Engineer
Aluminum Company of America

There are many ways in which the characteristics of structural aluminum might be presented, but perhaps the most effective way to present them to the engineer is to contrast a typical structural aluminum alloy suitable for heavy duty construction with structural carbon steel, the most commonly used structural metal. Recognizing that structural aluminum weighs only 35% as much as structural steel, the engineer might well ask himself "What do I have to give up in order to gain this saving in weight?" Using this approach, this paper draws a direct comparison between aluminum alloy 14S-T6 and structural carbon steel.

Compare Steel and Aluminum

There is no penalty involved in strength of aluminum. The minimum specified yield strength of 14S-T6 alloy in any of the forms in which it is employed by structural engineers is 53,000 psi, which greatly exceeds that of carbon steel. The corresponding value for ultimate tensile strength is 60,000 psi, which is a little above the minimum for carbon steel. Based on this combination of properties, a basic allowable working stress of 22,000 psi is recommended. This is, of course, above that for carbon steel. The typical shear strength of 14S-T6 alloy is 41,000 psi which is about the same as that of carbon steel.

The modulus of elasticity of 14S-T6, in common with other aluminum alloys, is considerably lower than that of steel; the value for 14S-T6 being 10,600,000 psi. Obviously, the result of this difference in stiffness is that engineers must pay more attention to problems of deflection and stiffness than when they use steel. A 14S-T6 beam of a given size, span and loading will deflect approximately three times as much as a similar steel beam. Where such an increase in deflection is really significant and requires attention, the most effective approach is to increase the depth of the beam. Where this can be done, the desired improvement in stiffness can always be attained without too severe a sacrifice in weight. Weight savings of 50% are attained under these circumstances. Fortunately, in many instances it is unnecessary to meet the deflection of the corresponding steel part and even greater weight savings are possible.

Shape of Stress-Strain Curve

The basic stress-strain curve for carbon steel is one having a pronounced flat spot at the yield point while that for 14S-T6 is a continuously rising curve without any such flat spot. In forming problems, the flat spot in the steel curve is a decided advantage but in strength problems it is a distinct disadvantage. When a steel member is loaded in compression and the stress is increased to the yield strength, the effective modulus drops abruptly to zero and the resulting loss in stiffness results in complete collapse. It is almost impossible to sustain compressive load on a steel member at any stress appreciably above the yield strength even for relatively low slenderness ratios. Members of 14S-T6, on the other hand, do not behave in this manner but retain a fair percentage of their original stiffness at stresses above the yield strength. For this reason, short columns of aluminum alloy can be loaded beyond their yield strength without collapse, thus giving a margin of safety not present in steel members. Figure 1 compares typical stress-strain curves for alloy 14S-T6 and carbon steel.

Tells Column Strength

As a direct result of the lower modulus of elasticity, the strengths of long columns in 14S-T6 are less than those for steel. For short columns, the higher yield strength of 14S-T6 and the absence of the flat spot in the stress-strain curve are reflected in column strengths greater than those for steel. The curves of allowable compressive stress cross at a slenderness ratio of about 60. In the range of large slenderness ratios it is often desirable to use columns of larger cross-sectional dimensions than would be used in steel in order to achieve efficient de-

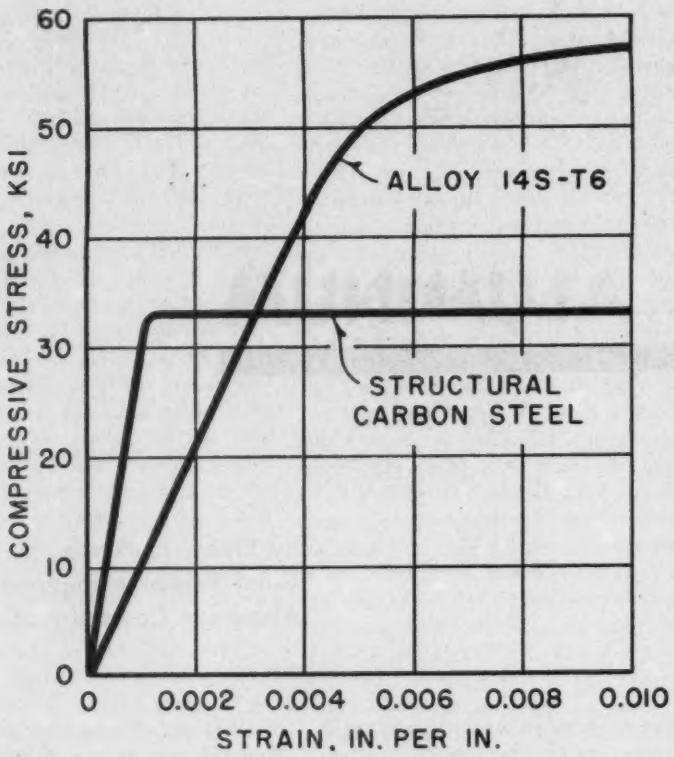


FIG. 1

sign. Even in this range, weight savings on the order of 50% are commonly attained if the cross-sectional dimensions of the members can be suitably increased over those for a corresponding steel design. Figure 2 shows a comparison of column curves for 14S-T6 and carbon steel.

Employ Effective Width Concept

The lower modulus of elasticity is also responsible for a lower resistance to local buckling. For this reason, greater attention must be paid to the proportions of flanges and webs in order to maintain adequate safety in compression members or in the compression flanges of beams and girders. It is not always economical in 14S-T6 structures to make parts so thick that the possibility of local buckling is eliminated from consideration as it often is in steel practice. Neither is it efficient to reduce the allowable stresses on complete members simply to maintain some nominal factor of safety against local buckling of the most critical part. This concept, while perhaps new to some civil engineers, is by no means an innovation since it has a long history of successful use in other fields of engineering.

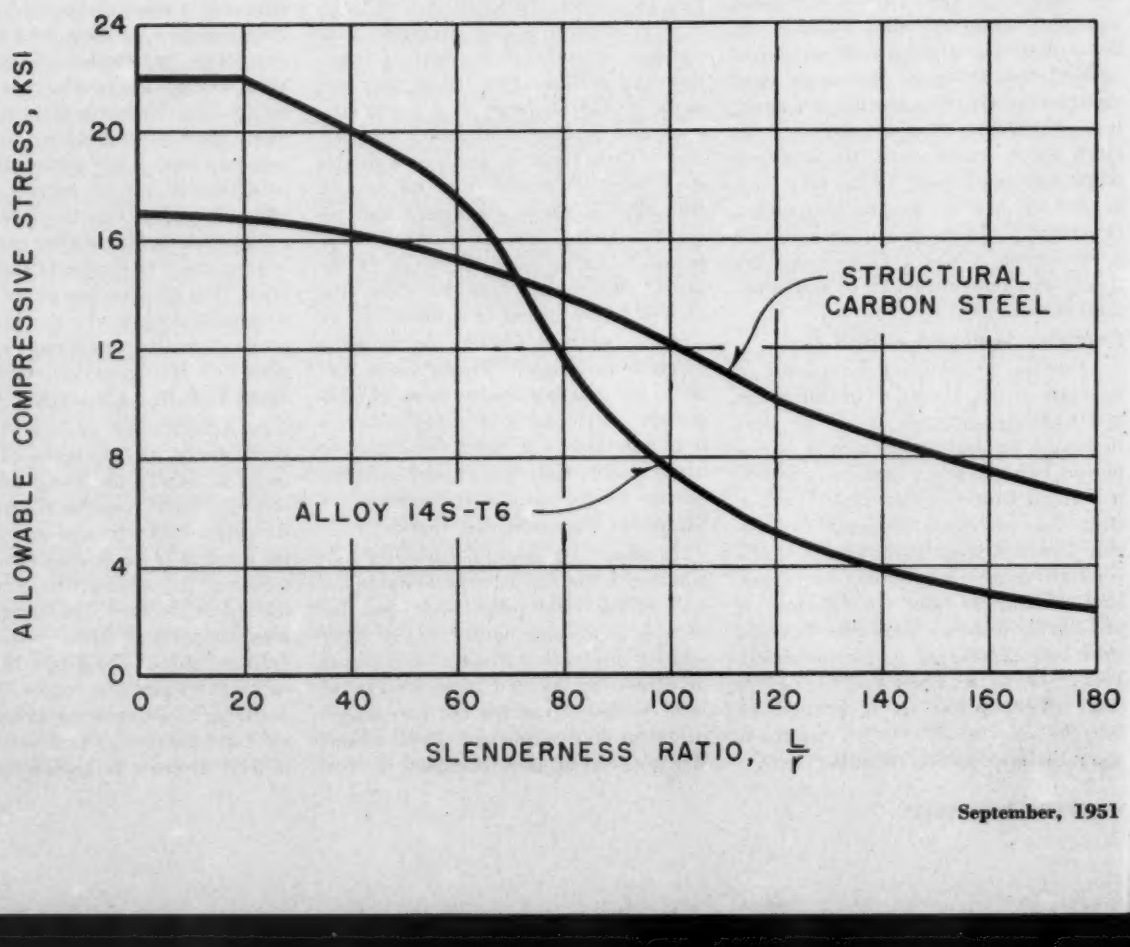


FIG. 2

Fatigue of 14S-T6 and Steel

The fatigue strength of alloy 14S-T6, as established by tests of polished specimens, is considerably below that for steel in the range of large numbers of cycles. It should be realized, however, that the fatigue strength of actual structures, members and joints cannot be obtained directly from the fatigue strength of the material established by tests of polished specimens. Fortunately, most civil engineers deal in structures which are relatively free of fatigue problems owing to the relatively small number of applications of the maximum loads for which the structure is designed. Where large numbers of applications of the principal loadings are involved, however, the importance of fatigue cannot be ignored and somewhat more attention may be required in aluminum alloy structures than would be the case for steel. On the basis of fatigue tests of riveted members, design charts have been prepared showing the allowable stresses for various numbers of repetitions of load application. Such a chart is shown in Figure 3. This chart is applicable only when reasonable care is taken in design and fabrication to eliminate unduly severe stress raisers and to take cognizance of important secondary stresses.

It should be emphasized that life under repeated loadings is much more affected by the design of a part than by the material used. In a recent investigation of fatigue strength of joints, it was shown that an improvement of life of more than 800 to 1 was possible simply by improving a design which originally was considered acceptable. The improvement involved the simple elimination of secondary bending and of the more obvious stress raisers.

Available in All Structural Forms

In view of the restrictions imposed by the present intense effort on the National Defense Program, it is not very timely to discuss actual availability of metal for general structural purposes. However, it will not be out of place to point out that alloy 14S-T6 is produced in all of the forms used by structural engineers such as sheet and plate, shapes, rod, bar, tubing and forgings. Sizes that are available in plate include thicknesses up to 3 inches and widths up to 10 feet. Lengths up to 39 feet are available for the most commonly used widths and thicknesses. Standard structural shapes include sizes as large as 8x8-inch angles, 15-inch channels and 8-inch H-beams. Many standard structural shapes are available in lengths up to 85 feet.

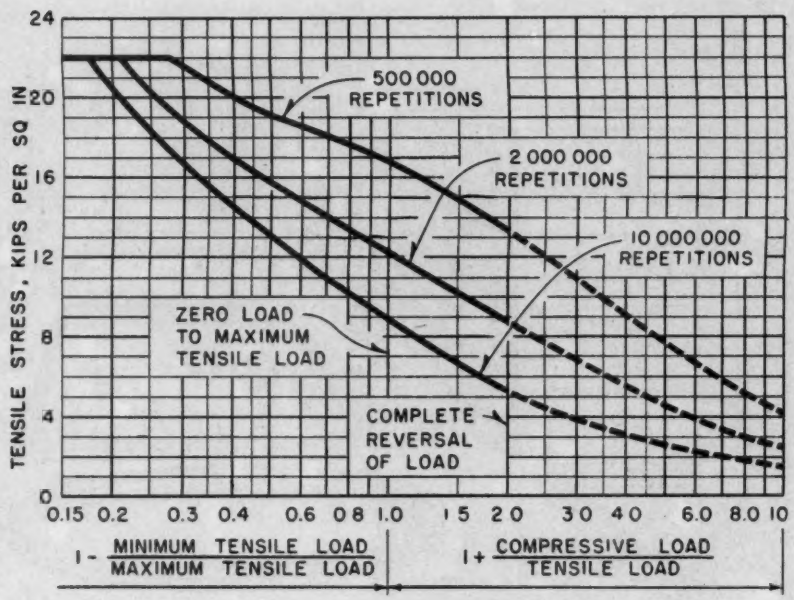


FIG. 3

In addition to the standard structural shapes, there are available an infinite variety of special shapes which can be produced by the extrusion process. Many dies are already available and others can be provided at a cost which is very low compared to the investment required to roll a new shape. Important weight savings have been effected in structures through the use of special extruded shapes where the number of parts justifies the extra tooling cost.

Fabricating 14S-T6 Similar to Steel

Experience has proved that structural aluminum moves through the ordinary fabricating shop smoothly and efficiently with little change in procedure compared to that used on steel. The use of sharp clean tools is advocated and in the thicker members, sawing and drilling rather than shearing and punching are usually employed. The burning torch is not used on the aluminum alloys.

The biggest difference in aluminum and steel construction comes in the use of welding. While welding is widely used on the softer aluminum alloys, especially in the construction of tanks and storage vessels, it is not recommended except in rare instances on a heat treated alloy such as 14S-T6. A great deal of research and development work is being done in this field, however, and present indications are that wider use of welding will be made on heavy duty structures of aluminum alloy. In the meantime, however, riveting continues to be the preferred method of assembly, particularly for structures of alloy 14S-T6. The recommended rivets for cold driving are of an aluminum alloy known as A17S-T4. Those rivets which must be hot-driven are of alloy 61S-T4. After driving, these rivets are designated A17S-T3 and 61S-T43 respectively. Aluminum alloy bolts are of anodized 24S-T4.

As would be expected on a heat treated material, all applications of heat during fabrication must be restricted. It is recommended that no parts be heated to more than 400°F for a period exceeding 15 minutes except for the hot-driven rivets. For heating rivets temperature must be controlled between 990 and 1050°F since the hot driving technique is also a solution heat treatment insuring the desired properties in the final driven rivet. Since the coefficient of expansion of aluminum alloys is twice that of steel, it is necessary sometimes to pay more attention to temperature changes in laying out dimensions.

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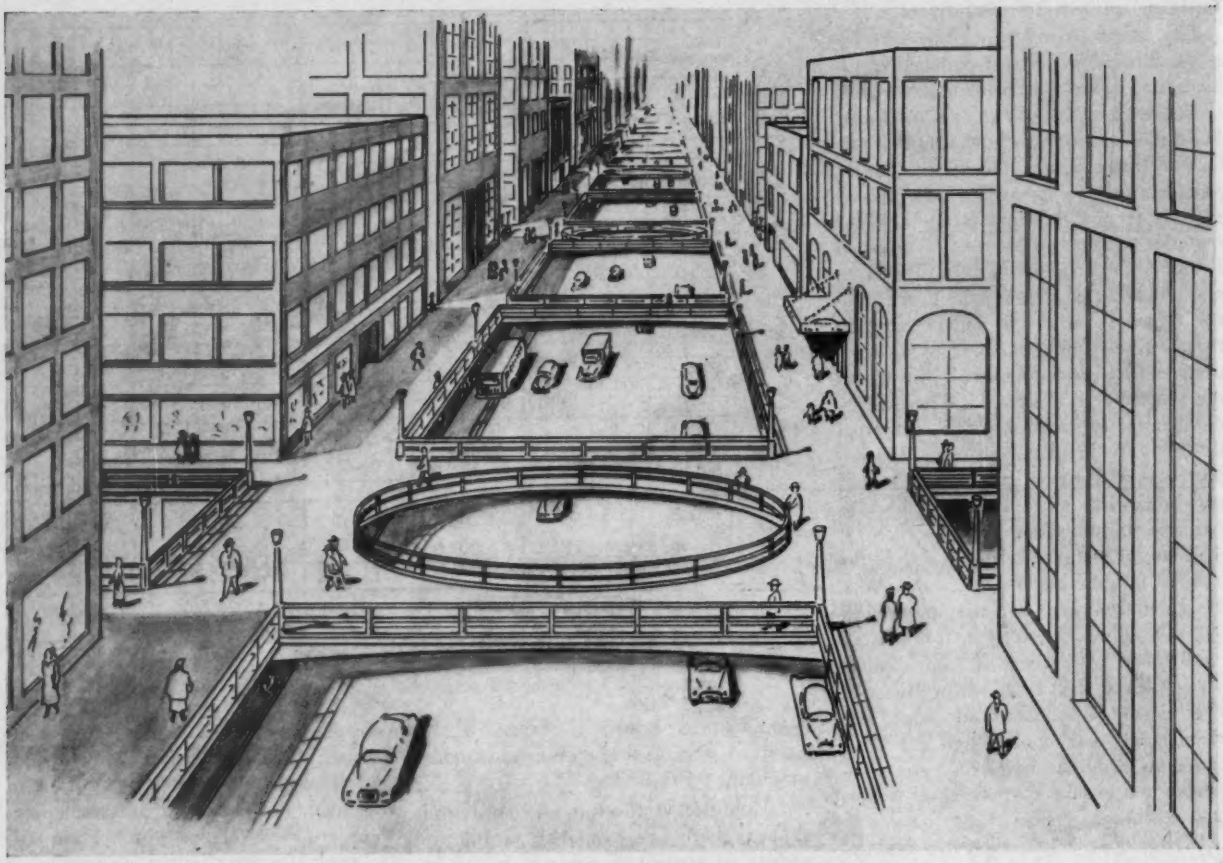


ABOVE:

Futuristic sketch of a downtown Chicago street with Elevated Walkways.

LEFT:

State Street, south at Randolph, August 1951

First Prize Paper
WSE Cash Award

Elevated Walkways *for* Downtown Chicago

By Albert L. Tholin

Chicago is literally "sick at heart." Still growing at its extremities, its heart —the central business district—is slowing down. Some say a city no longer needs a heart. The heart function—they say—can be dispersed into a half dozen or more focal points. To a limited extent, this is now happening in Chicago. Shopping centers are being developed at outlying locations. Downtown property values are declining. The decline during the last 10 or 15 years has been estimated as high as 33 per cent.

It is assumed in this paper that dispersion of the heart functions is unnatural, involuntary and tending to destroy the organic unity of the city.

The downtown district, with its large and varied shopping center, its theater districts, its throbbing business activities, its large churches, music halls, open air concerts, its proposed civic center, its very busy-ness, is the portion of the city which above all other areas differentiates the city from other less metropolitan areas.

There may be many reasons why Chicago is "sick at heart"—some physical, some political, some spiritual.

The problem to which this paper is addressed is a physical one—the problem of urban transportation—achieving freedom of movement—of circulation—within the heart of the city as enlarging traffic arteries bring ever-increasing numbers of people and vehicles into the central area. It relates itself, also, to the downtown parking problem.

The purpose is to present an idea not previously presented in this form. The concept of vertical separation of pedestrian from vehicular traffic, if embodied in a major public improvement, will create a new level of property values in the downtown area—will approximately double the vehicular capacity of the downtown streets—will provide uninterrupted, safe pedestrian movement on elevated sidewalk promenades at the second floor level—will release ground floor areas for automobile parking in the heart of every block—can be extended to provide at many locations, two-level, thru-the-block passageways, with show window space at the pedestrian level along these new passageways—will add other tangible and intangible increments of value to the downtown area, and, perhaps greater than all, will add a distinctive feature to Chicago to augment its renown as the economic capital of the world's richest heartland.

The idea presented is not new in urban planning, but, as far as the writer knows, has not been seriously considered nor analyzed with respect to Chicago. Elevated walkways were included in a portrayal of the "City of Tomorrow" at the New York World's Fair in 1939. The writer discussed their application to Chicago's traffic problems in an article on urban transportation in the following year. The relationship of pedestrian movements to the currently increasing traffic congestion is sufficient to warrant a new examination of the use of elevated walkways.

The present sidewalks, though vital to the pedestrian, form fixed boundaries, preventing lateral expansion of vehicular traffic. Either vehicles or pedestrians, or both, must find additional or substitute space by expanding vertically. It seems logical that the pedestrians, being lighter than trucks, busses and automobiles should move upward, releasing a part of their present occupancy to vehicular traffic. Walkways can be elevated without cutting off daylight and natural ventilation from the existing street level.

Further expansion of vehicular traffic should be downward as is now being done in the Wacker Drive Extension, as has been done in the freight tunnel system and the initial system of subways, and as proposed in street car and additional rapid transit subways.

(*Continued on Page* 12)

The Concept

It is well, first, to obtain a mental image of the suggested improvement. For this purpose the perspective sketch shown on page 10 was drawn.

The street shown is eighty feet wide. Without the elevated walkways, it would have a forty-eight foot pavement and two sixteen-foot walkways at present ground level. The elevated walkways shown are sixteen feet wide, supported on cantilever brackets from a single line of columns fitted close to the property line. Columns at twenty foot centers would encroach upon the walkways about two feet. The four-way pedestrian overpasses at street intersections are supported along their outer edges by two-hinged rigid frames resting on four concrete sub-piers close to the property corners. The central opening eliminates loads too distant from the supports. The use of a circular opening rather than a square one adds continuity to the structure and reduces the torsional stresses in the rigid frames at the outer edges of the structure. A slight rise from the edges of the structure toward the perimeter of the circle will add to the rigidity. With such a design, and the use of high strength steel, the structure need not be bulky nor unsightly.

The pavement at the present ground level is widened to sixty-four feet, leaving eight-foot walkways for passengers boarding and leaving vehicles, protected from rain and snow by the canopy of the upper walkway. The number of traffic lanes is increased from four to six.

Most of the business activities which now occupy the ground floor areas of downtown property, and which are more closely related to pedestrian than vehicular traffic, would be moved to the second floor. Much of the present ground floor area would be released from its present use to that of automobile parking. If all the ground floor areas in the district were so used, there would be storage for 20,000 automobiles.

The area considered for this improvement is bounded by Wacker Drive and its southward extension, and by Van Buren Street and Michigan Avenue.

All vehicular traffic is shown moving in one direction. The adoption of one-way streets for some of the downtown area is under active consideration. Such a program is assumed as a prerequisite of the improvement here proposed. In order to eliminate pedestrian interference with vehicular traffic, there are no street cars. Pedestrians would be prohibited from entering upon or crossing any pavement. Stairways in the middle of each block or in the present alley or court areas would connect the upper and lower walkways.

The elimination of the present elevated transit lines would also be a prerequisite of this plan.

An additional rapid transit subway and at least two street car subways should be built as a replacement for the present elevated structure and the most vital car lines. Stairways to subway mezzanine stations would be replaced by new stairways and escalators —leading to both the vehicular and pedestrian levels. These would be inserted into private property areas adjacent to the street lines.

Advantages to the Pedestrian

There should be no question but that elevated walkways as pictured here would be pleasing to the pedestrians. Entering the area from north or west of the River, pedestrians would leave the vehicular level in the first block from Wacker Drive. The present street grade in the downtown area is six feet lower than the established grade of Wacker Drive. The new walkways would rise nine feet, to an elevation fifteen feet above the vehicular level.

The pedestrian on the upper walkway would enjoy fresher air, more sunlight, freedom from splashing of water and slush thrown by passing vehicles, and—if radiant heating were built into all sidewalk areas—freedom from snow and ice during the winter season.

Possibilities for Beautification

The concept can be expanded to include increased beautification. Christmas decorations could occupy the circular spaces at street intersections. Provisions could be made for flowering plants at selected and controlled locations. One could even conceive of a fountain oc-

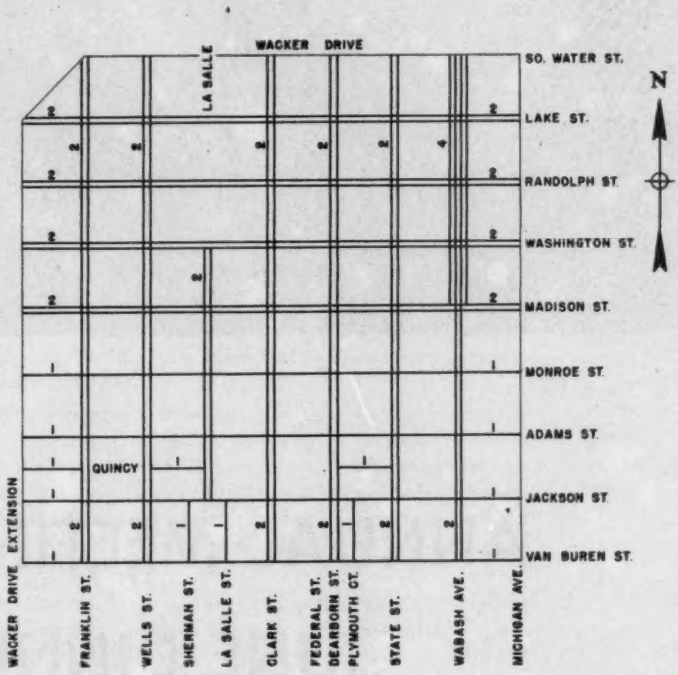
cupying an important street intersection at the pedestrian level. Made of light weight materials and with water storage off the structure, the added weight would present no great problem.

Extent and Distribution of New Traffic Lanes

Eighty foot streets would acquire two new traffic lanes. Sixty-six foot streets, now having only three lanes, would acquire one new lane. State street and, Wabash Avenue would have eight lanes each. These would be left as two-way streets.

The present vehicular space in the area totals 40 lane-miles. The total increase in the area shown would equal 17 lane-miles, a 43 per cent increase in available area. In addition to the benefits of the extra lanes, the efficiency of the existing lanes would be greatly improved so it is estimated that the overall traffic capacity would be doubled.

The added traffic lanes are distributed over all streets in the area—a feature that will be particularly vital after the completion of the radial system of superhighways and the Wacker Drive and Congress Street Improvements.



Estimate of Cost

Item	*UNIT COST* *Per Lin. Ft. of Walkway*	*Per Sq. Ft. of Walkway*	*Per Mile of Street (2 walks)*
Superstructure	$ 90.00	$ 5.60	$ 955,000
Foundation, Street Widening	140.00	8.75	1,475,000
and Surface Restoration	32.00	2.00	338,000
Radiant Heating	16.00	1.00	169,000
Lighting	$278.00	$17.35	$2,937,000
Engineering & Contingencies	42.00	2.65	443,000
TOTALS	$320.00	$20.00	$3,380,000

(*Continued on Page* 28)

President Becker
H. N. Muller, Speaker
Past President, Sedwick

ANNUAL MEETING
JUNE DINNER

Western Society's 83nd annual meeting and dinner held June 4th closed one of the Society's most successful years and served as the springboard to a continuation of achievements in serving the engineering profession, the Society and its members.

An air of jovial fellowship pervaded the large number of members and guests that filled the main dining room of The Furniture Club of America.

H. P. Sedwick, retiring president, greeted the guests and introduced the members of the Board of Direction, calling attention to three new members of the Board—Second Vice-President Charles E. DeLeuw, and Trustees A. P. Boysen of the American Bridge Co. and W. R. Marston, City Traffic Engineer.

Mr. Sedwick presented Life Membership scrolls to those members who had attained that honor. Albert L. Arenberg, Ray C. Brown, Charles E. DeLeuw, Charles S. Duke, William E. Findlater, E. Gordon Fox, Edwin C. Knuth, Joseph L. Kobylanski, Francis H. Kuhn, Lewis H. Sillcox and Thomas F. Wolfe.

Service awards for meritorious service rendered the Society were then presented by Mr. Sedwick. One went to Lee G. Bird, Chairman of the Excursion Committee, in recognition of the fine job he did for the membership in promoting an excellent series of well planned and attended excursions during the year; a second to Louis C. Gabbard of Illinois Bell Telephone Co. as a result of his well organized and energetic membership campaigning during the year 1949-50,

during which the greatest number of new applications were received in the Society's recent history. A third award was presented to Russell E. Anderson, Chairman of the Advertising Committee, in recognition of his work for the Society in this field.

Mr. Sedwick continued by pointing out that the Western Society of Engineers grants cash awards annually for the best papers submitted by members during the year. First award of $250 was presented to Mr. Albert L. Tholin of the City of Chicago for his paper "Elevated Walkways for Downtown Chicago" (printed in this issue). Second prize of $150 went to Ernest L. Abramson of Aurora Pump Company for his paper entitled "The Turbine Type of Peripheral Pump." Mr. Edwin M. Lurie of the U. S. Housing and Finance Agency, Washington, D. C., a non-resident member, came all the way from the nation's capitol to be present to receive third award of $100 for his paper "Plaster Cracks—But When?"

Leading up to the presentation of the Octave Chanute medal, Mr. Sedwick told of the establishment of a fund for awards for papers read before the Society in the various fields of engineering by Octave Chanute, President of WSE in 1901-1903, who collaborated with the Wright Brothers in the development of the airplane. Mr. Charles E. DeLeuw received the award medal for the presentation of his paper "Tollways" at the April 2, 1951 meeting of the Society.

Following the presentation of awards, Mr. Sedwick reviewed the year's activities. He said, "I would like to make a few comments on the affairs of the Society. We have had a good year financially—we had a substantial surplus and are in sound financial condition. Our technical meetings were uniformly good.

"The series of six meetings held as a Young Engineers' Forum was very successful. Leaders in various industries generously gave time to preparation and delivery of an outstanding group of lectures on engineering in their respective industry, with the result this series was very well received by both the engineers attending and their companies who cooperated.

"The Midwest Engineer has been well managed and edited during the year, and the fine work of the Advertising Committee in connection with it and the Year Book enabled the publication to be improved, as well as leading to a decision to publish the Midwest Engineer on a 12-month basis beginning with next fall.

"This year we signed a second affiliate agreement—the Illinois Engineering Council.

Mr. Harrington and the staff have worked hard; have done a constructive job; and are entitled to the thanks of the Society.

"It is with the utmost sincerity that I thank the membership for the opportunity of being one of the team of leaders of the Society during the past year. The group which you selected for administering the affairs of the Society and of the various Sections, as well as the Committee Chairmen, all cooperated to the fullest extent. In addition, we found it necessary to ask a number of individual members of the Society to carry out some particular assignment, and these were uniformly taken care of effectively. Some activities carried on during the year were outstanding and on the whole it has been a successful year for the Society.

"It would help the Society if more of the newer and younger members would take on a more active role. The officers recognize we had many cases of preference expressed for committee assignments we were unable to fill. An example is the Civic Committee where we had over a hundred such requests whereas we felt it necessary to limit the membership of the committee to about 60 in order to avoid its becoming unwieldy.

"On the other hand, one activity which can use additional help is arranging for and encouraging attendance at our Monday night technical meetings. This is a field in which anyone may receive a great deal of personal satisfaction and do a real service for the Society.

"I am not mentioning by name the large number of Board members; Society officers; section officers; committee chairmen; and individual members who have been so helpful to me this year—I'll just say 'thank you' to them as a group.

"The Society is fortunate in its new President. He has been a hard worker in the interest of the Society over a period of years. I am sure you will all join me in wishing him well and in holding ourselves ready to help him in any way we can—Your new President, Mr. Donald N. Becker."

With that introduction of the new president, Mr. Sedwick presented Mr. Becker with an engrossed scroll of presidency of the Society.

Mr. Becker responded by giving a brief statement of his aims for the current administration. He said: "I am indeed honored to have been selected as your president for the coming year. I am impressed with the strides we have taken since we moved to our present headquarters at 84 E. Randolph street. I only hope that during the coming year we will be able to consolidate our gains and continue to advance.

(*Continued on Page* 21)

MR. CHARLES E. DeLEUW
Octave Chanute Medal
Recipient

The Membership Committee is ready to step on the gas and 'gun' it all the way to the finish line.

Thirty teams will soon take the field and every driver will be looking to you for help in keeping your team in front.

Signed applications are the high octane fuel needed to keep them on the track.

It's your job to keep pouring Applications in.

WSE BOARD OF DIRECTION

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First Vice-President	Ovid W. Eshbach	Dean, Technological Institute, Northwestern University
Second Vice-President	Charles E. DeLeuw	President, DeLeuw, Cather & Co.
Treasurer	John F. Sullivan, Jr.	Asst. to Vice-Pres., Commonwealth Edison Company
Executive Secretary	J. Earl Harrington	Western Society of Engineers

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1949-52	Leroy F. Bernhard	Plant Extension Engineer, Illinois Bell Telephone Company
	Ludwig Skog	Senior Partner, Sargent & Lundy
1950-53	L. E. Grinter	Research Professor, Illinois Institute of Technology
	Arthur W. Howson	Engineer, Alvord, Burdick & Howson
1951-54	Albert P. Boysen	Division Engineer, American Bridge Company
	William R. Marston	Deputy City Traffic Engineer, City of Chicago

PAST PRESIDENTS

Gustav Egloff — Director of Research, Universal Oil Products Company

H. P. Sedwick — Executive Vice President, Public Service Company of Northern Illinois

SECTION, DIVISION, COUNCIL EXECUTIVE COMMITTEES

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Chairman — Gunni Jeppesen
Vice Chairman and Program — J. deN. Macomb
Publications — L. E. Grinter
Attendance — John F. Parmer
Fellowship — Elmer A. Johnson
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Program — William A. Finger
Publications — Robert C. Peterson
Membership — Milton S. Aronstam
Attendance and Fellowship — Charles Engler

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Program and Membership — Paul V. Henehan
Attendance — M. G. Markle
Fellowship — Paul C. Kreuch
Publications — H. A. Goss

Hydraulic, Sanitary and Municipal Engineering Section

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Vice Chairman and Publications — Peter M. Page
Program — William W. Mathews
Attendance — Gerald E. Riepe
Fellowship — Harry J. Bartz
Membership — R. A. Thompson

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Vice Chairman — George N. Simpson
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Publications — Joseph Kucho, Jr.
Attendance — Frank J. McKee
Membership — Donn O. Jennings

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Fellowship and Membership — James L. Foley, Jr.
H. Evert Kincaid
Walter E. Rasmus

Transportation Engineering Section

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Vice Chairman — Duncan M. Campbell
Program — Dick Van Gorp
Publications — Charles E. Keiser
Attendance and Fellowship — James D. Moffat
Membership — William R. McConochie

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Secretary, Publicity and Attendance — Elliott A. Johnson
Membership — James F. Judd
Program — James W. Barnett
Kenneth E. Reed

Professional Women's Council

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Vice Chairman — Mary Ann E. Crawford
Secretary — Terry Glenn
Membership — Mrs. Marylin Bolten
Program — Catherine W. Eiden
Publicity — Georgiana H. Peeney
Lois Graham
Mary L. Murphy
Ruth H. Perkins

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Alfred Noble Prize Award

L. K. Sillcox — Committee of Awards

American Association for the Advancement of Science

Gustav Egloff — Representative

Washington Award Commission

Members of the Commission

Leroy F. Bernhard
James D. Cunningham
E. Gordon Fox
L. F. Harza
Verne O. McClurg
Albert Reichmann
J. T. Rettaliata
H. P. Sedwick
Wilfred Sykes

Engineering Societies Personnel Service, Inc.

J. N. Stanbery

Illinois Engineering Council

Directors

R. E. Hattis
E. R. Hendrickson
W. R. Marston
Frank V. Smith

THIS SECTION WILL KEEP YOU POSTED FOR THE YEAR

YOUR W. S. E.

'Get-Together' in Lounge and Dinner 5 to 7:00 P.M.

Pre Meeting 'Movie' Between 7 and 7:30 P.M.

Sept. 24, 1951 GAS, FUELS & COMBUSTION ENGINEERING SECTION Sponsor Speaker	**Oct. 1** HYDRAULIC, SANITARY AND MUNICIPAL ENGINEERING SECTION Sponsor Speaker	**Oct. 8** MECHANICAL ENGINEERING SECTION Sponsor Speaker	**Oct. 15** TRANSPORTATION ENGINEERING SECTION Sponsor Speaker
Oct. 22 FALL DINNER MEETING Speaker	**Oct. 29** CHEMICAL & METALLURGICAL ENGINEERING SECTION Sponsor Speaker	**Nov. 5** JOINT MEETING— ELECTRICAL ENGINEERING & COMMUNICATIONS ENGINEERING SECTION Sponsor Speaker	**Nov. 12** BRIDGE & STRUCTURAL ENGINEERING SECTION Sponsor Speaker
Nov. 19 SOCIAL EVENT	**Nov. 26** CIVIC COMMITTEE Sponsor Speaker	**Dec. 3** JOINT MEETING— TRAFFIC ENGINEERING & CITY PLANNING SECTION & FIRE PROTECTION & SAFETY ENGINEERING SECTIONS Sponsor Speaker	**Dec. 10** SPECIAL MEETING Speaker
Dec. 17 GAS, FUELS & COMBUSTION ENGINEERING SECTION Sponsor Speaker	**Dec. 24** NO MEETING MERRY CHRISTMAS	**Dec. 31** NO MEETING HAPPY NEW YEAR	**Jan. 7, 1952** JUNIOR DIVISION Sponsor Speaker
Jan. 14 HYDRAULIC, SANITARY & MUNICIPAL ENGINEERING SECTION Sponsor Speaker	**Jan. 21** MECHANICAL ENGINEERING SECTION Sponsor Speaker	**Jan. 28** JOINT MEETING—BRIDGE & STRUCTURAL ENGINEERING & TRANSPORTATION ENGINEERING SECTIONS Sponsor Speaker	**ATTEND WSE LUNCHEONS** **Every Wednesday** **Snappy Talks** **Over at 1:15 P.M. Sharp**

KEEP THIS SECTION FOR HANDY REFERENCE

CALENDAR

Meetings Start
7:30 P.M. Sharp

Meetings Close
9:00 P.M. or Earlier

Feb. 4, 1952 COMMUNICATIONS ENGINEERING SECTION Sponsor Speaker	**Feb. 11** CHEMICAL & METALLURGICAL ENGINEERING SECTION Sponsor Speaker	**Feb. 18** WASHINGTON AWARD DINNER Speaker	**Feb. 25** TRAFFIC ENGINEERING & CITY PLANNING SECTION Sponsor Speaker
Mar. 3 ELECTRICAL ENGINEERING SECTION Sponsor Speaker	**Mar. 10** WOMEN'S COUNCIL Sponsor Speaker	**Mar. 17** FIRE PROTECTION & SAFETY ENGINEERING SECTIONS Sponsor Speaker	**Mar. 24** SPECIAL MEETING Speaker
Mar. 31 TRANSPORTATION ENGINEERING SECTION Sponsor Speaker	**Apr. 7** JOINT MEETING— CHEMICAL AND METALLURGICAL & GAS, FUELS & COMBUSTION ENGINEERING SECTIONS Speaker	**Apr. 14** SOCIAL EVENT	**Apr. 21** COMMUNICATIONS ENGINEERING SECTION Sponsor Speaker
Apr. 28 TRAFFIC ENGINEERING & CITY PLANNING SECTION Sponsor Speaker	**May 5** JOINT MEETING— MECHANICAL ENGINEERING HYDRAULIC, SANITARY AND MUNICIPAL ENGINEERING SECTION Speaker	**May 12** FIRE PROTECTION & SAFETY ENGINEERING SECTION Sponsor Speaker	**May 19** BRIDGE & STRUCTURAL ENGINEERING SECTION Sponsor Speaker
May 26 ELECTRICAL ENGINEERING SECTION Sponsor Speaker	**June 2** NO MEETING (Memorial Day Week-end)	**June 9** ANNUAL MEETING AND DINNER	**ATTEND WSE GOLF TOURNAMENT** **Some Time in July** ***Watch for Notice***

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Vincent W. Nass
William F. Schlax
Harold F. Sommerschield
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Thomas G. Robinson
Richard C. Schipper
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H. P. Sedwick

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H. Evert Kincaid (T E & C P)
George Krambles (Trans.)

Committees shown as of copy closing date for this issue. Additions will appear in new Year Book.

Annual Meeting

(*Continued from Page* 15)

President Becker Tells Aims

"Under the able direction of your officers during the past two years, a deficit in Society funds which had accumulated since the depression of the early 30's has been greatly reduced. It is my hope that we will be able to wipe it out entirely during the coming year. This can be accomplished by keeping our expenditures within our budget coupled with an intensified program to increase our income through the addition of at least 500 new members and through increases in other revenue sources such as rentals of our meeting rooms, publication, advertising and a more complete use of our dining facilities by our own members. It is proposed to foster events at our headquarters which will attract more of our members to make use of our facilities. Many of our members, I am sure, have not as yet visited our new headquarters. They have not seen the club facilities we offer which are comparable to those of many of the private clubs in town and at a fraction of their costs.

"We plan to expand social activities with a view to serving more of our members and their families. This past year we inaugurated special weekly noon luncheons at which short talks were given on assorted topics, only a few of which were of an engineering nature. We have not given these noon luncheon meetings much publicity, for the reason that we primarily hope to develop a habit and spirit of fellowship among our members so that each Thursday noon they would know by attending these luncheons that they would meet many of their business and professional friends. We, therefore, made little if any attempt to build up attendance for any particular speaker. This practice met with a fair degree of success. Our dining room will be closed for the summer but we plan to reopen in September with the service in the dining room entirely revamped and we will then renew the weekly luncheon speaker programs.

"I am greatly interested in increasing the activities of the Society particularly those designed for the younger members. It is hoped that the Junior Division's activities will be generously attended by our older members. I for one have enjoyed my contact with this division in the past. I also plan to see that each committee of the Society has at least one active member from the Junior Division on it.

"This past spring the Society has sponsored a forum for young engineers which Mr. Sedwick has already covered. Of the 100 young men who attended this course, many have since joined or filed applications with the Society. These young men will form useful additions to the Junior Division. We are now planning for another forum to start in the fall and applications are now in after I have completed the list.

"It is also planned to keep up the good work of the excursion committee of the past year, by having excursions to places of interest about Chicago. Also, we have set July 20th for our second golf day. Last year's event drew a happy group of members and guests.

"I will now list the chairmen of the sections, divisions and committees for the ensuing year. Will you please rise after I have completed the list."

At this point, Mr. Becker read the list of newly elected chairmen of the various sections and committees of the Society. Mr. Becker continued saying:

"With the able assistance of these committees, the chairmen of the sections and the very capable Board of Direction on my right and left, I anticipate a very good year.

"Finally, I wish to state that all the efforts of your Society, its Officers, Board of Direction, Committees, Section and Division Officers would come to naught without an efficient office staff. I take this opportunity to give especial credit to Dr. Gustav Egloff, who, during his administration as your president year before last, secured Earl Harrington as your Executive Secretary. Mr. Harrington has brought order out of chaos and is the one who has been so instrumental in leading the Society out of financial red by his capable administration of the Society's business for the past two years. He has also reorganized the office staff into an integrated operating unit so that the affairs of the Society run very smoothly.

"The staff consists of Miss Henkel, Membership, Miss Boothe, Accounting, Mrs. Frasca, Secretary and Miss McKune, the Midwest Engineer. Thank you."

At the conclusion of Mr. Becker's remarks, Mr. Sedwick arose to introduce the speaker of the evening, Mr. H. N. Muller, Assistant to the Vice-President in Charge of Engineering of Westinghouse Electric Corp., Pittsburgh, Pa.

Mr. Muller responded with a most timely and interesting address, entitled "Memo to Engineers" in which he pointed out the necessity of sound thinking and action if we are to preserve the American way of life. He stressed the responsibility of mature engineers and management in guiding and developing young engineers into becoming better engineers and citizens by inculcating in them an appreciation of the professional growth attainable by full participation in engineering societies and in civic affairs. (Mr. Muller's address appears as a feature article elsewhere in this issue.)

WSE Personals

E. A. Armstrong, manager of industrial and power sales for Public Service Company of Northern Illinois, celebrated his 30th anniversary with the company on May 9th.

Virgil Gunlock, Commission of Subways and Superhighways, City of Chicago, is currently serving as President of Illinois Society of Professional Engineers.

Henry E. Theobald is now with the Travelers Insurance Co. He formerly was General Insurance Broker with the Mutual Benefit Life Insurance Co.

Wallace B. Behnke, Jr., electrical engineer with Public Service Company of Northern Illinois, is now serving with the armed forces in Korea.

Raymond D. Berry, formerly Vice President of Gallaher & Speck, has been made President of the company.

Earle D. Lyon, staff engineer with the Commonwealth Edison Co., recently retired after 37 years of service with the company.

James R. Jones, formerly combustion engineer with Northern Illinois Coal Company, is now associated with Southern Illinois Coal Co., Inc., 333 N. Michigan Ave.

Donald G. Storey, Lt. Comdr., CEC, is stationed at the Naval Air Station, Glenview, Ill.

Edward M. McMillian has been recalled by the Air Force, serving as a jet pilot, and holds the title of Capt. His employment is Assistant Engineer with Massey Concrete Products Co.

Mr. Julius L. Hecht, Past President and Life Member of WSE, and Vice President in Charge of Operations of Public Service Company of Northern Illinois, retired from active duty after 45 years with the company on August 1st of this year. He will continue with the company as a Consulting Engineer.

A graduate of Massachusetts Institute of Technology, Mr. Hecht has for many years been a leader in the utility engineering field. He is directly or indirectly responsible for many of the modern engineering developments related to the generation and distribution of electricity.

Mr. Hecht will be under considerable demand as a consultant, due to his wide experience and ability, but it is hoped that he may be in a position at times to give even more generously of his time to WSE in the future.

WSE congratulates Mr. Hecht on his achieving a goal equaled by few other men in the profession.

Wilfred C. Burdick of the A. L. Jackson Co. is now a Lt. Col. with the Air Force—Mid Central Air Procurement District, Chicago.

Edward G. Rohn, Jr. has advised us he is ordnance engineer located at Aberdeen Proving Ground, Md.

Robert J. Woolsey is with the Signal Corps at Camp Cooke, California, with rank of Major. He is employed by Illinois Bell Telephone Company as engineer.

Dr. Gustav Egloff, the flying ambassador of the petroleum industry and WSE, has returned from the Hague, Holland where he spoke before the World Petroleum Congress.

On his return to this country he found many requests for his appearance at various functions waiting. He found he was scheduled to be one of a four-man panel at the Oil Industry Information Committee of the American Petroleum Institute at the Blackstone Hotel on August 14th.

During September Dr. Egloff will attend the Conference of the International Union of Pure and Applied Chemistry, where he will present a paper entitled "Polymerization of Mono-Olefins with Solid Phosphoric Acid Catalyst." From this meeting which will be held in New York, he will drop down to Atlantic City to address the National Petroleum Association on the subject "European Refining and Middle East Oil."

Dr. Egloff has been invited to be a guest of the Venezuela Government during his attendance at the National Petroleum Convention in Caracas the latter part of September.

Junior Division Plans

The Junior Division is planning a full program for the 1951-52 year consisting of the Junior Engineer's Round-Table Talks, scheduled on the first Wednesday evening of each month, the sponsorship of a general meeting on January 7, 1952 and participation in the Charles Ellet Award Competition.

The Junior Engineer's Round-Table Talks will be a series of meetings designed to give the younger WSE members a broader background and better understanding of general fields related to engineering. Leading men from our local area will speak on the topics of Politics, Unions, Ethics and Law, and Insurance and Safety Engineering. The Charles Ellet Award Competition is open to members under 30 years of age. The Award is given for excellence in written and oral presentation of a technical paper submitted in the competition.

The Junior Division would like to extend a hearty welcome to all its new members and invite the participation of all members in the activities of the current Society year.

Crerar Library

News and Notes

The administrative offices of the Library have had their turn at renovation during the summer. The removal of obstructing partitions, a new office for the Assistant Librarian, relocation of the Board Room, and redecoration throughout (with a splash of color) have given the 11th floor a "new look." Included in the remodelling was the relocation of the library research office of Western Electric Company, now in room 1101.

For Economy in Research is a booklet describing the services of Research Information Service. It has just appeared in a second edition. Copies may be had on request to RIS or the Office of the Librarian, (telephone AN 3-6660).

The collections of the Library keep growing Winter and Summer. Constant watch is kept for periodicals, especially, which should be added to the list of current subscriptions. Already, during 1951, some 150 new subscriptions have been announced in the fortnightly issues of *These are New* in the Technology Department.

During the Summer, a number of reference books of interest to engineers have been added to the collections:

Bailey, A. E. *Industrial Oil and Fat Products.* New York, 1951

Diesel Engine Catalog. Vol. 16, New York, 1951

Gardner, H. A. *Physical and Chemical Examination of Paints.* 11th ed. 1950

Molloy, Edward. *Modern Oil Engine Practice.* 4th ed. London, 1950

Neville, L. E. *Aircraft Designers' Data Book.* New York, 1951

Sorenson, H. A. *Gas Turbines.* New York, 1951

Zimmerman, E. W. *World Resources and Industries.* New York, 1951

The John Crerar Library building at 86 East Randolph Street has been open for public service for 30 years, 1921-1951. Previous to 1921, the Library was located in the upper floors of the Marshall Field Building, with entrance off Wabash Avenue.

Obituaries

J. L. Bridges, retired district engineer of the Chicago Park District, died June 13th in Passavant Hospital. Mr. Bridges was a Navy veteran of World War I, and spent his entire career in the water works and sewage treatment field. He was a member of the W. S. E. since 1928.

Herbert W. Kelly, one of the more recent members of W. S. E. died April 25th. Mr. Kelly was superintendent of the Tarrant Foundry Company at the time of his death, and spent his entire engineering career in the foundry business.

A. R. Mitchell, life member of W. S. E., died June 30th. He joined the Society in 1920 and was a graduate from the University of Wisconsin. He started his engineering career with the Chicago, Burlington & Quincy Railroad, later transferring to the Santa Fe Railroad, where he was employed until the time of his death.

Matthias B. Schaeffer, co-founder of James, Schaeffer & Schimming, construction engineers and surveyors, died July 5th, in his office here in Chicago. Mr. Schaeffer became a member of the Western Society of Engineers in May of this year.

Arthur L. Webster, civil engineer and realtor, died July 8th. He served as Du Page County superintendent of highways and as City Engineer of Wheaton, Illinois. His membership in W. S. E. dates back to 1912 and at the time of his death he was a life member.

Carl O. Mueller, President of the Mueller Construction Company, died July 1st. He was a graduate of the University of Illinois in architectural engineering. Mr. Mueller was known for his integrity and ability in the construction engineering field, and his death will be a distinct loss to many of the members of the Society.

Wm. C. Curd, civil engineer and railroad specialist, joined the W. S. E. in 1920 and at the time of his death on July 20th was a life member. Many of our members will remember him when he was associated with the American Association of Railroads and, more recently, with the Chicago Plan Commission.

Walter H. Flood, President and owner of Walter H. Flood & Company was a life member of W. S. E., and died April 25th. He was founder of the Flood inspection and testing laboratories. Mr. Flood's memoirs will be retained in the minds of his many friends among our membership as a consultant in the field of chemical engineering, and for his activities in the Chemical and Metallurgical Section of the Society.

J. N. Thoren, a member since 1920 and a life member since 1950, died November 12, 1950. Mr. Thoren received his B. S. in civil engineering from the University of Illinois. He was associated with the Morava Construction Company, The McClintic Marshall Co. and the Bethlehem Steel Co. for thirty-eight continuous years. During this time, he served in the capacity of draftsman, chief draftsman and engineer. He retired in June of 1949.

AnnounceConference on Water Resources

A conference will be held October 1-3, 1951, celebrating the dedication of the new laboratory and office building of the State Water Survey Division of the Illinois Department of Registration and Education, on the campus of the University of Illinois, Champaign-Urbana. The Conference will be in three parts devoted respectively to: Hydrology, Water Treatment, and Radar-Meteorology. The Hydrologic conferences will be held in special rooms in the Illini Union Building. The Chemistry conferences will be held in the new East Chemistry Building auditorium, and the Radar-Meteorology conference will be held at the nearby Allerton Estate.

Dr. A. M. Buswell, Chief of the Illinois State Water Survey Division, announces that leaders in all three fields have been engaged to address the conference delegates. A dedication dinner will be held in the Ballroom of the Illini Union Building on October 2.

An interesting program is being worked out for the wives of registrants and several field trips are being arranged. These will include a visit to the Radar-Weather Stations operated by the Survey at the University of Illinois Airport and at El Paso, Illinois, and one day trip to Peoria to inspect the Survey's new infiltration pit and hydraulic laboratory located on the banks of the Illinois River.

John W. Barriger To Deliver Roy V. Wright Lecture

At ASME Fall Meeting Minneapolis Sept. 26-28

A program of 23 sessions during which 49 technical papers will be delivered has been announced by The American Society of Mechanical Engineers for its Fall Meeting in Minneapolis, Minn., Sept. 26-28 at the Hotel Radisson.

Recent developments and new trends in mechanical engineering will be highlighted in the technical program.

In addition to the technical papers, the program will include an address by the ASME president, J. Calvin Brown.

Dr. Frederick Oederlin, managing director, in charge of engineering, Sulzer Brothers, Ltd., Winterthur, Switzerland, will deliver the Calvin W. Rice Lecture. His topic will be, "Engineering Achievements in Switzerland and Their Background." Mr. Rice served as secretary of ASME until his death in 1934, devoting his life to increasing understanding between engineers of the world.

The Roy V. Wright Lecture, in honor of the late Dr. Wright, president of the society in 1931, and former state senator of New Jersey, noted for his activities in impressing upon engineers and young people the duties, privileges and responsibilities of citizenship in a democracy, will be presented by John W. Barriger, III, president of the Chicago, Indianapolis and Louisville Railway.

Col. Carey, ASCE Elected President Engineering Societies Secretaries Council

Col. William N. Carey, Secretary of ASCE, was elected President of the National Council of Engineering Society Secretaries at the Council's Annual Meeting in Rochester, New York in June.

Other officers elected were Henry S. Harris (Engineers' Club of Philadelphia) Vice President; Ernest Hartford (ASME) Secretary; Frank G. Horton (Engineering Society of Detroit) Treasurer. Directors elected were: O. Laurence Angevine (Rochester Engineering Society); Henry H. Henline (AIEE); Edward H. Robie (AIME); Kenneth F. Treschow (Engineers Society of Western Pennsylvania).

Rochester Engineering Society was the host society for the Rochester meeting. Under the able direction of O. Laurence Angevine, retiring President of the Council, a splendid program was presented.

The Council will meet in Chicago in 1952 at the Western Society of Engineers and assist in celebrating the Centennial of Engineering.

Public Works Ass'n. Meeting Sept. 16-19

Traffic safety and the effect of heavy trucks on the highways of America will highlight general sessions of the 1951 Public Works Congress and Equipment Show this month. The Congress, sponsored annually by the American Public Works Association, will be held September 16 through 19 at the Veterans' Memorial Building in Detroit (Mich.).

Tying-in with such scheduled sessions as those on refuse collection, street maintenance, sewage treatment, and highway construction will be the year's largest public works equipment show. Space for the 34,000-square-foot show, sold out several weeks ago, has been taken by 56 of the nation's leading manufacturers and equipment dealers.

Memo to Engineers

(*Continued from Page 6*)

some kind of evil. Those who criticize profits either ignore or gloss over the fact that an economic system is sparked by two mighty forces. These are *incentive* and *competition*. Profits provide the incentive. Competition guarantees that the profits will not be, or at least can't for long be, excessive. Competition is the cleansing agent of the American economy. It assures us that unless inefficiency and dishonesty are eliminated, the enterprise will whither and die.

In short, we must have incentive for people to work, to save, and to risk. We must have competition to guarantee that we shall have the "greatest good for the greatest number—widespread distribution of good products at lowest practical prices.

It's high time that this undermining of our great industrial assets is stopped, and the engineers can play a leading role in the process. You are a distinguished group in a very necessary profession, so let's each one be certain that his thinking is as practical in this basic element of our economy as it is in his technology. Take an objective look at your own thinking. Are you as susceptible as your janitor, or the cab driver to sugar-coated economic propaganda? It is so easy to believe, and when you do raise questions, do you have effective arguments to support your convictions? You can, if you stay with your basic fundamentals such as goods equals production; freedom from want equals individual enterprise; and the rest of these simple equations that are almost in the category of copy-book maxims.

The insidious part of this slow departure from American ideals and American business enterprise, even the individual freedom that has to be inherent to support a professional way of life, is that it is a sort of creeping paralysis. Each measure that proposes additional collective security sounds pretty good. Each "liberal innovation," so called, with a professional do-gooder as its official advocate, sounds like a real bargain. All put together, they simply mean that individual pride is replaced by government dependence, that self-confidence is replaced by collective reliance; and in the end, that dependence replaces independence, the person is submerged by the State — and then what are we fighting for? So at that stage, security through government has replaced freedom; whether economic, political, or eventually religious freedom. Are we going to do our part to stop such evils from devouring our ideals?

Earlier I mentioned that we should discuss several factors of extra-curricular engineering. I feel this business of sound economic principles is the *most* important simply because there won't be a free America for our next generation of engineers if we can't lick this problem first.

Extra Curricular Training of Engineers Brings Dividends to Employers

In your daily pursuits each of you come into contact with young men who have just left school, or who have been in practice only a short while. You and I both want these young graduates to get into the right job, to become a productive part of our organizations quickly, to accept and discharge real responsibility with expediency—in short, to become mature professional men. Have we a right to expect this to be an automatic process, or to be solely the result of the individual's own efforts? For the beginner who is either most exceptional or just falls into very fortunate circumstances, it may be. But for the vast majority, your help will make a tremendous difference. This fact is recognized and proven by those engineers and those organizations who have taken positive steps to help develop new technical manpower. It is one of the best investments in time or money that you can make, and the things you have to do aren't very difficult.

First, exactly like anything else, professional growth has to have a healthy atmosphere. Management must appreciate that their greatest single asset is their educated manpower. Only then will they desire to utilize each man to the fullest extent of his ability, and thus be moved to provide the necessary orientation and training, encouragement toward participation in the technical societies and encouragement toward continued education. Only then will management be a positive help to the man in becoming a constructive civic influence. If this atmosphere does not exist, failure is inevitable because real development of young talent is inherently impossible in uninspired environment. I know that in my personal experience, it is a daily satisfaction to say "I am with Westinghouse," not "I work for Westinghouse."

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Memo to Engineers

(*Continued from Page* 25)

In recent years more employers of engineers are recognizing the dividends that accrue from good training beyond the college years. An understanding of the organization and the opportunities inherent to a technical career, some assurance that the right man is in the right job—both pay off in quicker productivity, greater job stability, and higher ultimate potential. Yet only a few consider it any of their business to see that young men appreciate the growth opportunities available through full participation in engineering societies, and even fewer make any effort to introduce them into their community and its activities.

Engineers have a reputation for being backward in civic programs and civic development. Earlier we discussed positive measures that established engineers can undertake to remedy some of the aches and pains of our profession, and even of our general American society. Why wait fifteen or twenty years to get started? Give the junior engineer in your company, or in your engineering society, or in your community a job to do! Make sure he is welcomed, introduced to his seniors, and that his efforts are recognized. Give him tactful guidance, of course, but then look out for his smoke, for the energy and enthusiasm of youth, once kindled, is a powerful driving force.

Place Young Engineers in Jobs Where Continued Challenge Exists

Finally, what happens when these young engineers begin to feel their professional oats; that is, when the transition period from academic life to practice is behind them and their horizons begin to broaden rapidly? At this point the boss has another obligation to youth. We must never be guilty of blocking a man just because he has a healthy boss. We must stand ready to recognize developed ability once it is present and keep the engineer whose "star is still rising" up to his limit in increasing responsibility. He will only continue to develop at a maximum rate if his work is a challenge to his ability and experience, so that while he *can* keep his head above water, it is *not* without some struggle. If you are careful to place your young engineers in jobs where continued challenge exists, you may be amazed to see how rapidly they grow to meet the opportunity that they, then, are able to see.

Engineers to Preserve the American System of Enterprise

Our profession of engineering is responsible for most of the material progress in the world. With each technological innovation, the position of the engineer becomes more prominent, and the role of the engineer more necessary. In the nineteenth century, the engineer invented things and sometimes built things on a modest scale. In the past fifty years the engineer, besides inventing, became the expert on materials and processes, and thus created a mass production world, vastly complicated in nature. As we enter the second half of the twentieth century it is evident that the engineers are the ones who must be responsible if our accelerated pace is to be maintained. Furthermore, the engineers will have to run our enterprise, for with each increase in the complication of our technical society, engineering background becomes a requisite for more and more of the key jobs. Even today graduate engineers fill more of the top management jobs than people of any other one educational background. This trend will continue until a preponderance of all key men of management will be engineers.

What a tremendous responsibility this is! Our profession is rapidly ascending to a position where our members can, if they will, be the greatest single influence in the future of America. So we *must* keep our thinking broad in scope. We cannot allow our routine tasks to dull our vision. We *can* provide the kind of leadership that will preserve the American system of enterprise and stop the fuzzy, foggy, economic thinking that would destroy our loftiest ideals. And of great importance, we can do a professional job of providing healthy internship for our junior members, including the proper introduction to their professional societies and their communities. We owe the rising-generation of engineers all the guidance we can offer, because they in turn, are going to have to assume the responsibility of bringing the next generation into an even more complicated way of life.

END

Elevated Walkways

(*Continued from Page* 13)

Applied to a typical existing eighty foot street, the cost per lane-mile of vehicular traffic added is $1,690,000. The overall average for the downtown area will be about $2,000,000 per lane-mile.

If there were no concomitant benefits of any sort, the cost of the additional traffic lanes would compare favorably with the cost of traffic lanes in superhighway construction in and about central business areas. The entire cost cannot, however, be rightly charged to vehicular traffic.

Using the above unit cost of typical walkway, and doubling this amount for street intersections, the total cost of the new structures and street widening for the area will be approximately $35,000,000.

Operating Cost of Radiant Heating

Radiant heating of sidewalks and roadways has had only limited application.

In Detroit, a 500 foot long ramp to a superhighway is electrically heated. The heat is applied through steel grids buried in the concrete directly under each wheel track. In the first winter's operation it was used for a total of 549 hours. At two and one-half cents per K.W.H. it cost $1,041 for the season, equivalent to seventy cents per sq. ft. per year.

In Chicago, the Commonwealth Edison Company has been heating 2,260 square feet of sidewalk in front of their office building. A mixture of water and anti-freeze is circulated through a system of tubes buried in the walkway. Heat is obtained from steam passing through a heat exchanger. The system is in operation all winter but the temperature of the circulating liquid is varied so as to maintain 40° to 50° F. on the sidewalk surface. In the first season it was operated 4,300 hours. The cost for steam was $600. This is equivalent to twenty-seven cents per sq. ft. per year.

An electrical load for this purpose is probably not desirable to the power company and would not be subject to preferential, off-peak-load rates. The writer has assumed, therefore, that the best heat source would be steam, purchased from a utility company, perhaps organized for the specific purpose. Considering the larger scale of operation for the proposed walkways, the annual cost is estimated at 20 to 25 cents per sq. ft. of walkway.

Special Considerations With Regard To Michigan Avenue

Included in the estimated total cost are elevated walkways on both sides of Michigan Avenue, north of Randolph Street, but on only one side south of Randolph Street.

No pavement widening is included for Michigan Avenue. The broad sidewalks at the present level would remain.

South of Randolph Street, the upper level walkway would be twenty feet wide, a continuous promenade deck, overlooking Grant Park and Lake Michigan. Show window space would be doubled and there should be no loss of rental for the ground floor areas.

Effect Upon Existing Buildings

One can scarcely consider the concept of elevated walkways without thinking of their effect upon existing buildings. The necessary "face lifting" and alteration of existing buildings raises an immediate barrier against the concept. Extraordinary problems, however, require extraordinary solutions. The cost of the remedy must be balanced against benefits derived, and compared with the cost of other solutions.

Considering these buildings as income-producing properties, the question can be stated as follows:

> Will the income after completion of the improvement be enough greater than present income to warrant the large capital expenditures for building alterations to conform to the new walkway level?

Any complete answer to this question is beyond the limitations of this paper.

The increasing seriousness of traffic congestion and lack of parking facilities is already making it difficult to find a firm basis for long term leases in the downtown area. Disintegration has commenced. If the contemplated improvement will reverse this trend, the large expenditure may be justified.

Suppose, at the risk of over-simplification, we make a few assumptions. Let us assume, first of all, that the improvement will require substantial interior alterations of the lower thirty feet (1st and 2nd floors) of a building having an interior depth of 120 feet. We can then consider an elemental slice of the building with one foot of frontage, 30 feet in height above the present

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Painting Alloy 14S-T6

Structures of alloy 14S-T6 can often be left unpainted, owing to the good resistance to corrosion of this material. Any corrosion products formed are nearly colorless and nonstaining. Where conditions are relatively mild, they will be of an entirely superficial nature. For more severe environments, however, thorough painting of heavy duty structures of 14S-T6 is recommended using materials and surface preparation techniques recommended for such work. Where such paint protection is needed, it is always recommended that suitable protection be given the faying surfaces.

Where freedom from painting is an important consideration and where the conditions of exposure are somewhat more severe than considered proper for alloy 14S-T6, it is recommended that aluminum alloy 61S-T6 be employed. This material, while not as strong as 14S-T6, is an excellent structural material of unusually high resistance to corrosion. The American Society of Civil Engineers' Committee on Design in Lightweight Structural Alloys is now preparing a design specification for this material paralleling that already issued for alloy 14S-T6 as A.S.C.E. Proceedings Separate No. 22, June, 1950.

Cost of Aluminum Alloys

The cost per pound of aluminum alloys is, of course, considerably in excess of that for carbon steel. A part of this difference is simply a difference in weight which disappears when the comparison is made on a volume basis. Size for size, however, aluminum alloy parts are still more expensive than steel, so that the use of aluminum alloy in heavy duty structures is definitely restricted by this important consideration. In certain specialized structures having unusually high ratios of dead load to live load, enough weight may be saved to make the aluminum alloy design cheaper on a first cost basis. In medium size stationary heavy duty structures, however, aluminum alloys are used only where some important advantage other than decreased dead load accrues from their use. In movable structures, savings in operating costs and increased payload are frequently the controlling factors, which of course account for the widespread use of aluminum alloys in the transportation field.

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FRANK ERWIN RICHART
WSE Representative on Highway Research Board, dies

Professor Frank Erwin Richart, internationally known investigator and teacher in the field of reinforced concrete, died July 16 at his home in Urbana, Ill. Because of ill health he had been on leave of absence from the University of Illinois department of theoretical and applied mechanics.

Professor Richart was born in Lena, Illinois on May 11, 1892. He received his B.S. degree in civil engineering from the University of Illinois in 1914, his M.S. there in 1915, and the professional degree of Civil Engineer in 1922. After experience in industry, he joined the faculty in 1916 and rose to the rank of full professor in 1931.

He was married in 1917 to Mary Fern Johnson. Mrs. Richart, two children—Professor Edwin Richart of Harvard University and Mrs. Kathryn Izzard of Amarillo, Texas—survive.

He was the representative of the Western Society of Engineers on the Highway Research Board, a past president of the American Concrete Institute (1939) and of the Central Illinois Section of the American Society of Civil Engineers, a recent vice-president of the American Society for Testing Materials and an honorary life member of that organization, Wason medalist of the ACI in 1938 and Lindau medalist of the Reinforced Concrete Institute in 1949, and active as an officer and committee member in many other organizations including the Society for Experimental Stress Analysis, Sigma Xi, Tau Beta Pi, and Phi Kappa Phi.

He was the University of Illinois faculty representative on the Big Ten board from 1942 to 1950 and had previously served as a director of the University's athletic association.

Oliver W. Tuthill, *who has been on special assignment with the American Telegraph Company in New York, has been appointed State Area Chief Engineer for Illinois Bell Telephone Company.*

Tuthill *succeeds* John S. Chase, *who retired at the end of August, after 46 years in telephone work.*

Tuthill *joined New Jersey Bell Telephone Company as a student engineer in 1928, after graduation from Stevens Institute of Technology. Before his AT&T assignment, he was general commercial manager of New Jersey Bell.*

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Aluminum Applications

Structural aluminum alloys have had a wide acceptance in the field of bridge railings and other similar items which are perhaps as much architectural as structural. They have not been so widely used in bridge structures themselves, largely because it has been difficult to justify the extra cost involved. Nevertheless, aluminum alloy bridges involving substantial amounts of structural aluminum have been built and are of considerable interest in providing valuable experience in this field of heavy duty construction. Table 1 shows the principal applications of aluminum alloys in bridge construction.

No discussion of structural aluminum alloys in bridges would be complete without some mention of their application to military bridges. There are great advantages to light weight aluminum alloys in structures such as the M-4 floating bridge which consists of aluminum pontoon boats surmounted with aluminum alloy welded balks which serve the double purpose of stringers and roadway surface. Less known is the developmental work being carried on by the Engineer Research and Development Laboratories on various tactical bridges.

The most common uses of structural aluminum alloys, of course, are in the field of transportation where the extra cost over steel construction is readily justified by increased payload, savings in operating costs, reduced maintenance, improved appearance, etc. Many interesting examples of uses could be given in this field but in view of the fact that these have become quite familiar to nearly everyone in recent years, attention will be turned instead to a few examples in the field of fixed or semi-fixed structures.

There is an aluminum alloy conveyor bridge in service in Louisiana. The bridge consists of three plate-girder spans, each approximately 65 feet long carrying a conveyor belt which transports bulk sulphur from the storage piles to the cars. The entire bridge travels laterally on rails and caterpillar tractors to the location where it is needed at any time.

Other typical uses of aluminum alloy are railroad engine houses and outdoor electrical substations or switching stations, because of the corrosive condition present in such structures. Through the use of aluminum alloy 61S-T6, it is possible to dispense with all painting of such structures and, therefore, avoid shutting off the electrical power in the lines.

TABLE I

Name of Bridge	Date	Location	Type	Traffic	Principal Alloy	Span Length, ft.
Smithfield St.	1933	Monongahela River Pittsburgh, Pa.	Floor System Only	Streetcar, Vehicular, and Pedestrian	27S-T	360
Grasse River	1946	Grasse River, Massena, New York	Plate Girder	Railway	14S-T	97.5
Hendon Dock	1948	Sunderland Docks, England	Double Leaf, Trunnion Bascule	Railway & Vehicular	17S-T	Movable Span 109
Clunie	1950	River Tummel, Pitlochry, England	Truss	Pedestrian & Cattle	AW10E AW10B	Center — 172.5 Sides — 69
Arvida	1950	Saguenay River, Arvida, Quebec, Canada	Fixed Arch	Vehicular & Pedestrian	Alcan 26-S-T	Center to Center of Skewbacks — 290

WSE Applications

In accordance with the By-laws of the Western Society of Engineers, the following names of applicants are being submitted to the Admissions committee for examination as to their qualifications for admission to membership into the Society in the various grades, i.e., Student, Associate, Member, Affiliate, etc. All applicants must meet the highest standards of character and professionalism in order to qualify for admissions, and each member of the Society should be alert to his responsibility to assist the Admissions committee in establishing that these standards are met. Any member of the Society, therefore, who has information relative to the qualifications or fitness of any of the applicants listed below, should inform the Secretary's office, 84 E. Randolph St., RAndolph 6—1736.

1-83 Earl H. Boesenberg, Staff Assistant-Office Engineer,' Public Service Company of Northern Illinois, 72 W. Adams St.

2-83 H. T. Boyd, Railroad Engineer, DeLeuw, Cather & Co., 150 N. Wacker Dr.

3-83 Clifford N. Brandon, Jr., Consulting & Application Engineer, Westinghouse Electric Corp., Merchandise Mart Plaza.

4-83 R. N. Dawson, Chemical Engineer, Armour & Co., 1355 W. 31st St.

5-83 Frank J. Dubsky, Designer Draftsman (Struct'l.), DeLeuw, Cather & Co., 150 N. Wacker Dr.

6-83 Edward F. Koncel, Jr., Assistant Electrical Engineer, Public Service Company of Northern Illinois, 72 W. Adams St.

7-83 Harry H. Parker, Chemical Engineer, Process Dev. Dept., Armour & Co., 31st St. Auxiliaries, 1355 W. 31st St.

8-83 William S. Woolsey, Senior Engineer, Commonwealth Edison Co., 72 W. Adams St.

9-83 Herbert H. Post, Assistant Control Engineer, U. S. Steel Co., 3426 E. 89th St.

10-83 Walter J. Shewski, Assistant Engineer, Public Service Company of Northern Illinois, 72 W. Adams St.

11-83 Ralph A. Munkers, Manager Electric Prod'n., Public Service Company of Northern Illinois, 72 W. Adams St.

12-83 Thaddeus R. Maslanka, Assistant Supt. of Constr'n. and Maintenance, Standard Oil Co. (Ind.), 20 N. Wacker Dr.

13-83 James H. Erwin, Superintendent, Gas Div., Central Illinois Electric and Gas Co., 303 N. Main St., Rockford, Ill.

14-83 Steven M. Grant, Superintendent Maintenance, University of Chicago, 5831 University.

15-83 John A. Johnson, 1553 W. 91st Street.

16-83 George A. Mast, Prod. Mgr. and V. P. of Eng., Spincraft, Inc., 4122 W. State St., Milwaukee, Wis.

17-83 Wilbur D. Warner, Materials Handling Engineer, Sears, Roebuck & Co., 925 S. Homan Ave.

18-83 Harlan K. Hoyt, Efficiency Engineer, Commonwealth Edison Co., 1111 W. Cermak Rd.

19-83 William W. Garton, Assist. to Field Supt., Abell-Howe Construction Co., 53 W. Jackson Blvd.

20-83 Robert E. Coates, District Manager-Chicago Office, S. Morgan Smith Company, 20 N. Wacker Drive.

21-83 Edwin E. Kinney, Manager, Engineering and Research Division, Outdoor Advertising Assn. of America, Inc., 24 W. Erie St.

22-83 A. S. Barnard, Design Engineer, United States Steel Co., Gary Steel Works, Gary Ind.

23-83 Norman E. Wandke, Assist. Engineer, Commonwealth Edison Co., 72 W. Adams St.

24-83 W. H. Scott, Executive Assistant Mgr. of Purchases, Standard Oil Co., 910 S. Michigan Ave.

25-83 Bryce P. Schofield, Associate Chemical Engineer, Armour Research Foundation, 35 W. 33rd St.

Elevated Walkways

(*Continued from Page 28*)

street grade, and 120 feet deep. The volume of this element is 3,600 cu. ft. Its floor area is 120 sq. ft. at each level. Then assume that the face of the building will need to be changed for an additional thirty feet of height, or a total of sixty feet. If interior alterations cost $2.00 per cu. ft., and new facing materials cost $10.00 per sq. ft., then the cost of alterations would be 3,600 cu. ft. @ $2.00, plus 60 sq. ft. @ $10.00, or a total of $7,800.

The unit prices and extent of alterations used are intermediate values. In some cases they would be considerably less—in other cases, much more.

To achieve equity of distribution of these costs, a means of assessment would have to be developed—collecting for benefits and paying for damages.

Continuing, let us assume that the increase in yearly rental value should be eight per cent of the alteration cost, or $624 per year. If we then assume that the present ground floor rental is twenty dollars/sq. ft./year and the present second floor rental is four dollars/sq. ft./year, we can consider the effect of the improvement upon these rental rates. If the new pedestrian level acquires a value twenty-five per cent higher than the present ground floor, or twenty-five dollars per sq. ft. per year, and the present ground floor drops to four dollars/sq. ft., the net increase is five dollars/sq. ft. over 120 sq. ft., or six hundred dollars per year. This would approximately balance the assumed cost of alterations.

The illustration is, of course, a hypothetical one. Actual case studies would vary widely. The figures are presented to indicate that the improvement—revolutionary as it is—is within the realm of reason. An adequate answer will require an analysis of a sufficient number of actual properties to arrive at an estimated cost of the "face lifting" operation—followed by a plan for equalization of the cost among all property owners.

The procedure is not without precedent. The building of the original Wacker Drive Improvement and its present extension necessitated the establishment of new sidewalk grades, causing material alterations to existing structures. The problem posed herein differs only in the extent of the alterations.

Effect Upon the Parking Problem

One of the aspects of the downtown parking problem is finding space close to the destination points of the vehicles, the use of which can be justified economically in competition with other forms of land use. In the heart of the city, the present ground floor rental values are too high to encourage large scale use for parking.

In the example cited above, the future level of high values is assumed to be at the pedestrian level, and a future value of only four dollars per sq. ft. was assumed at the vehicular level.

Not all the ground floor or vehicular level would be converted to parking and income would still be available from certain types of business establishments having store fronts adjacent to the bus loading areas and interior parking areas.

Summary

Traffic congestion in the downtown area of Chicago is nearing the "end point" of complete stagnation. The completion of the radial system of superhighways without the addition of new traffic lanes in the heart of the city may produce during critical hours a condition of complete immobility.

Vertical separation of pedestrian traffic offers an attractive method for creating new traffic lanes, well distributed over the downtown area, at less cost—so far as the public improvement is concerned—than by any other method yet proposed.

The cost of the improvement is in two parts:

(1) A thirty-five million dollar traffic improvement, chargeable against motor fuel tax and corporate funds of the City.

(2) Building alterations, chargeable as an assessment against the private property.

The cost of "face lifting" of the existing buildings is within the realm of reason from a long range viewpoint. Large numbers of the downtown buildings are, or soon will be, ripe for replacement. If the total cost of alteration of the more modern buildings is distributed over the whole downtown area, the cost will probably be less than fifteen per cent of the present valuation of the area. By assessing for benefits and paying for damages, this cost would be equalized and the total cost would, in the opinion of the writer, be returned in increased property values.

The parking problem would be substantially reduced by release of present ground floor areas for that purpose.

In the council chamber of the new city hall in Birmingham, Alabama, are inscribed the words:

"Cities are what men make them,"
to which the writer would like to respond:

"Yes, by men they are made,
And by men they may also be destroyed,
Or just allowed to die."

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CHIEF ELECTRICAL ENGINEER. E. E. 40. Two yrs. engineering coordinator with complete responsibility of engineering department mfg. electrical control equipment. Thirteen yrs. design and development of controls for Diesel electric locomotives, printing equipment, and welding apparatus. One and a half yrs. utility power plant operator. $10,000. Midwest. 132-M.W.

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PROCESS OR PRODUCTION ENG. M.E. 24. Six mos. foundry project research on sand and scrap. Six mos. tool design covering jigs, fixtures and perishable tools. Four yrs. machine operator. Midwest. $4800. 142-M.W.

INDUSTRIAL ENGINEER. 28. Four and a half yrs. exp. all phases industrial engineering in food and rubber. Three yrs. managing warehouse of 50 employees. Prefer Midwest. Will Travel. $450 mo. 144-M.W.

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Reviews of Technical Books

Available at WSE Headquarters

Chemical Dictionary

The Condensed Chemical Dictionary, Francis M. Turner. editorial director. Reinhold Publishing Corporation, New York, fourth edition 1950. 726 pages, with alphabetical thumb index. $10.00.

Originally published in 1919, and twice previously revised, the present edition has been rewritten and considerably expanded by Arthur and Elizabeth Rose. The editorial director states that this dictionary contains "all substances likely to be of commercial importance, or scientific news worth, and a long list of terms relating to chemistry and the chemical industries. . . . A valuable feature is the large number of specialties, sold under trade marks or brand names . . ." Usually reference is made to the manufacturer, or manufacturers, from whom each of these chemical specialties can be obtained. It also is stated that 5,000 items have been added since the third edition, making the new total in excess of 23,000 items. Some of the added items are quite recent discoveries, for instance ACTH, others have just passed the pilot-plant stage and are about to be placed on the market.

There are several features of this dictionary that may have special interest for many readers, namely, (1) a guide to the pronunciation of chemical words, (2) data on the chemical and physical properties of chemicals and raw materials, (3) types of shipping containers used or required, (4) shipping regulations and safety instructions for all items, (5) accelerated expansion in fields of current interest, such as nuclear chemistry, chemotherapy, and petrochemistry.

H. H. F., W. S. E.

Engineering Mathematics

The Mathematical Solution of Engineering Problems, by Mario G. Salvadori. McGraw-Hill Book Company, Incorporated, New York, first edition 1948. 245 pages. $3.50.

"Mathematics is a type of shorthand particularly well adapted to the language of logic or common sense." So says the introduction to this text. The author reviews and integrates the important varieties of mathematics usually taught at different places in an undergraduate engineering curriculum, and aims to widen the mathematical knowledge of both undergraduate and graduate students. The book is also well adapted to home study for self improvement. The collection of more than 1,000 problems taken from the various fields of engineering, physics, and mechanics is quite noteworthy.

H.H.F., W.S.E.

Law, Ethics and Business

Business, Legal, and Ethical Phases of Engineering, by D. T. Canfield and J. H. Bowman. McGraw-Hill Book Company, Incorporated, New York, N. Y., first edition, 1948. 358 pages. $4.50.

This book is a combination and revision of two earlier books by Purdue professors, namely, (1) Legal and Ethical Phases of Engineering, and (2) Business Administration for Engineers, both jointly written by the late Dr. C. F. Harding and Prof. D. T. Canfield, the latter being also co-author of the present book. The authors, in their preface, explain the pressure of wartime and postwar change to slant engineering curricula toward (1) requirements of the armed services, (2) advancements in technology, and (3) inclusion of more so-called humanistic subjects. Cramming new and expanded subjects into a four-year engineering course has necessarily meant compression of some of the remaining subjects.

The present book is definitely written for senior electrical-engineering students, although about three-quarters of it could be used equally well in courses other than electrical. It is divided into five parts, containing in round numbers the pages indicated, as follows: (1) Business Economy, about 60 pages, devoted mostly to money, finance, insurance, and economic selection; (2) Cost Determination, about 70 pages, devoted mostly to accounting, to cost, and to rates in the electric utility industry; (3) Business Law, about 85 pages, devoted mostly to the usual contents of an introductory book on this subject, such as contracts, agency, and sales agreements; (4) Engineering Procedures, about 60 pages, devoted to four fundamental procedures for professional and personal conduct; and (5) three Appendices, about 75 pages together. Two of these appendices, written by other authors, are notable papers presented before large national technical societies a few years ago. They were well received when presented, and they merit numerous reprintings for even wider circulation among all engineers and executives irrespective of age or rank.

One of the keynotes of this book appears in the introduction to part one, where it says in part: "We might define (engineering) as the art of efficiently utilizing the elements of production to produce something of value to society. It follows that an engineer is one who practices this art. By elements of production is meant the five M's: money, management, men, machines, and materials. . . . Machines and materials always have been in the province of the engineer, and his training has always been such that he is capable of handling these items well. It is frankly the intention of this text to de-emphasize machines and materials and to bear down on money, management, and men."

H. H. F., W. S. E.

Metallurgy

The Metallurgy of Steel Castings, by Charles Willers Briggs. McGraw-Hill Book Co., Inc., New York, 1946. 633 pages.

The point of view taken in this book is one of technical control of all operations for the production of steel castings. In order that quality control can be formulated, a thorough understanding of the technical problems encountered is necessary. The book is a very practical approach to the problem since it is based upon lectures delivered to technical and operating men of the Steel Foundry Industry.

Production of steel for steel castings is gone into in considerable detail. Tapping and pouring, liquid contraction and fluidity of the liquid cast steel is touched on lightly. Steel molding sands and cores and what happens when the molten steel comes in contact with these sands receive quite a little attention. Solidification of steel castings, contraction in the solid state and defects encountered are most fully described. Methods of cleaning the castings after they have been removed from the molds, the important subject of heat treatment and metallography together with the welding inspection and properties of steel castings complete the subject matter.

It is a book for designer, producer and user of steel castings. Numerous charts, illustrations, photographs, and an extensive bibliography at the end of each chapter make this a fine addition to the publisher's metallurgy and metallurgical engineering series.

J. K., W. S. E.

Thermodynamics

Theory and Practice of Heat Engines, by Virgil M. Fairies. The Macmillan Company, New York, 1948. 388 pages. $5.00.

This text might be called a one-volume encyclopedia on power production. It combines an introductory course in theoretical thermodynamics with a terminal course in heat power. While the latter is the prime objective, the former is presented in an attractive way that should be advantageous to engineering students not yet informed about all the elements that must be considered in a well-integrated power plant.

In addition to all the usual types of steam-driven prime movers and boilers (or steam generators), and to practically all types of so-called steam-power-plant auxiliaries, space is given to gas, gasoline, and diesel engines, to compressors, fans, rotary blowers, rotary compressors, helical-lobe compressors, automotive engines, superchargers, axial-flow compressors, turbo-jet engines, spray ponds, cooling towers, and an atomic power plant. Practically no item of consequence has been omitted from text and illustrations. Methods of combustion, fuel preparation, flue gas analysis, and general plant efficiency all have a fair share of space.

Most of the mathematical treatment is limited to algebra and elementary calculus. The choice of type face and paper stock has resulted in a particularly legible and attractive book; there also are more than 250 well-drawn illustrations. The author is professor of mechanical engineering at the Agricultural and Mechanical College of Texas, and previously wrote a text on Applied Thermodynamics.

H.H.F., W.S.E.

Satisfactory Approximation

Numerical Methods of Analysis in Engineering (Successive Corrections), by Hardy Cross and others, edited by E. L. Grinter. The Macmillan Company, New York, 1949. 207 pages. $5.80.

This book is "dedicated to Hardy Cross whose simple demonstration of the power of numerical analysis brought these methods within the horizon of practicing engineers." The preface starts with these sentences: "When a solution is impracticable, an engineer must be prepared to devise a satisfactory approximation. This approach, so inherent to the practice of engineering, was formalized in the Hardy Cross procedure of moment distribution. Engineers sensed that Cross was only organizing in a formal way the procedures of approximation that they had intuitively been using when rigorous mathematical analysis proved impractical."

When Prof. Cross began to write formal papers on this subject he was on the faculty of the University of Illinois, but since then he has become Chairman of the Department of Civil Engineering at Yale University. The value of his achievement was publicly recognized by a special conference in Chicago at which 10 significant papers were presented by authors representing several different branches of engineering. These 10 papers now form the chapters of this book, including two by Prof. Cross and Prof. Grinter, respectively.

H.H.F., W.S.E.

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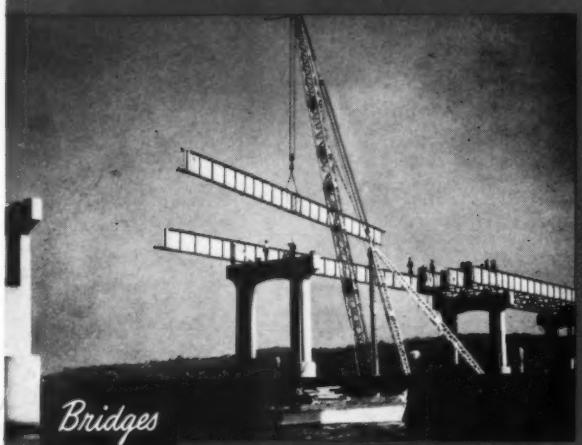

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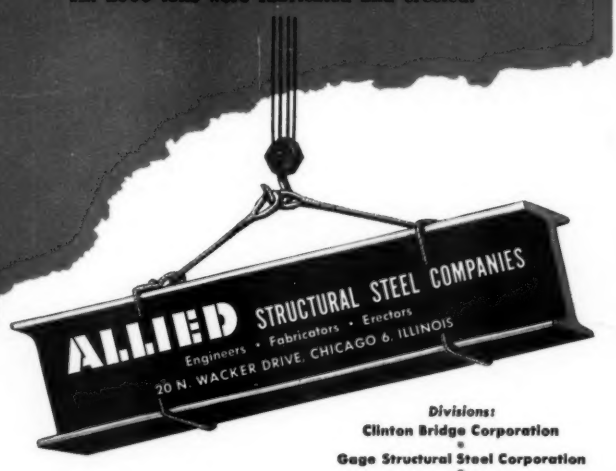

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